

# Globally Important Agricultural Heritage Systems (GIAHS) Proposal

## Rice Terraces System in Southern Mountainous and Hilly Areas, China



Chongyi County, Jiangxi Province, China

Longsheng County, Guangxi Province, China

Xinhua County, Hunan Province, China

Youxi County, Fujian Province, China

November 12, 2017

## SUMMARY INFORMATION

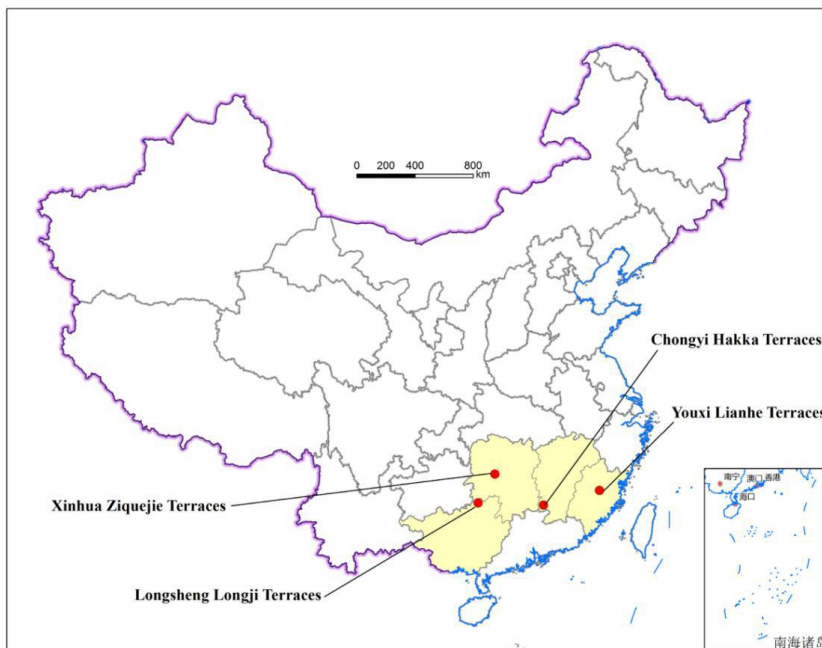
**Name/Title of the Agricultural Heritage System (local Name and Translation, if necessary):**

Rice Terraces System in Southern Mountainous and Hilly Areas, China

**Recommending/applying organization:**

Chongyi County, Jiangxi Province, China  
Longsheng County, Guangxi Province, China  
Xinhua County, Hunan Province, China  
Youxi County, Fujian Province, China

**Country/location/Site:**



Rice Terraces System in Southern Mountainous and Hilly Areas is located in provinces of Jiangxi, Guangxi, Hunan and Fujian, China. Hakka Terraces are located in Chongyi County, Ganzhou City, Jiangxi Province, at longitude 113°55'-114°38'E and latitude 25°24'-25°55'N, covering townships of Shangbao, Sishun and Fengzhou. Longji Terraces are located in Longsheng County, Guilin City, Guangxi Province, covering Longji Township at N25°42'-25°50' and E 110°04'-110°11'. Ziquejie Terraces are located in Xinhua County of Loudi City in central Hunan Province, covering Shuiche, Fengjia and Wentian Townships, at N27°28'-27°45' and E110°52'-111°00'. Lianhe Terraces are located in Lianhe Township, Youxi County, Sanming City, Fujian Province, China, between 26°17'-26°24'N and 118°08'-118°17' E.

**Accessibility of the Site to Capital City or Major Cities:**

Chongyi County where Hakka Terraces are located is 65 km away from the center of Ganzhou City and 63 km away from the Golden Airport of Ganzhou City. Xia-Rong Expressway crosses Chongyi County and connects it with Chenzhou City and other cities in the neighbor province of Hunan. It is also 30 km away from Shao-Gan Expressway which links it to all the cities in the neighbor province of Guangdong. In addition, it is 69 km from Ganzhou railway station and 30 km from Dayu railway station, both of which are linked to the nationwide railway network.

With the convenient transportation, Longji Terraces are about 20 km from the center of Longsheng County, about 80 km from Guilin City, about 50 km from the Liangjiang International Airport of Guilin City, linked by National Road 321.

Xinhua County where Ziquejie Terraces are located is about 200 km from Changsha City, the capital of Hunan Province. The highways crossing Xinhua include Loudi-Huaihua highway, G207, S312, S225 and S217. Shanghai-Kunming Railway, Jiaozuo-Liuzhou Railway, Hunan-Guizhou Railway and Luoyang-Zhanjiang Railway pass through the county. The nearest airport is the Huanghua Airport in Changsha City.

Youxi County where Lianhe Terraces are located is 158 km away from Fuzhou City, capital of Fujian Province, 208 km away from Fuzhou Changle International Airport. Electrified high-speed rail like Xiangtang-Putian High-speed Rail passes through Youxi County. It is also connected to other cities by expressways such as Fuzhou-Yinchuan Expressway, Xiamen-Shaxian Expressway and Putian-Yanling Expressway as well as 314 Provincial Road.

**Approximate Surface Area:**

For Hakka Terraces, the area of the proposed site is 521.15 km<sup>2</sup>. For Longji Terraces, the area of the proposed site is 237.70 km<sup>2</sup>. For Ziquejie Terraces, the area of the proposed site is 446.61 km<sup>2</sup>. For Lianhe Terraces, the area of the proposed site is 103.18 km<sup>2</sup>.

**Agro-Ecological Zone:**

Mountainous and hilly areas for forestry and agriculture in the middle and low reaches of Yangtze River of China

**Topographic Features:**

The topography is featured with middle/low mountains and hills which cover more than 70% of the total area of the proposed site.

**Climate Type:**

Subtropical monsoon climate

**Approximate Population:**

For Hakka Terraces, the population of the proposed site was 36,354 in 2015. For Longji Terraces, the population of the proposed site was 15,981 in 2015. For Ziquejie Terraces, the population of the proposed site was about 90,000 in 2015. For Lianhe Terraces, the population of the proposed site was 22,000 in 2015.

**Main Source of Livelihoods:**

Hakka Terraces supply 76.5% of food crops (like rice, wheat and corn), various oil-bearing crops, vegetables and fruits for the local people. In 2015, the economic revenue of proposed site was 1,357 million yuan. The income from farming/agriculture contributed 87.8% to the total income of the rural household in the proposed site while that from agriculture and forestry contributed 78.7% to the total income of the rural household in the core area in 2015.

In Longji Terraces income are mainly from the cultivation of field crops, fruits and vegetables, and tourism. Agricultural output value of proposed site in 2015 was about 209.23 million yuan, accounting for 26% of the total gross value, and the tourism income of the whole proposed site was 64 million yuan, accounting for 8% of the gross value.

Food and vegetables for local people in the Ziquejie Terraces are mainly supplied by the system. The agricultural income of Ziquejie Terraces accounted for 25.41% of the local GDP in 2015. The income from rice accounted for 50% of the agricultural income, other crops for 18%,

livestock and poultry for 20%, aquatic products for 2%, and forest products for 10% in that year.

The agricultural income of Lianhe Terraces reached 350 million *yuan* in 2015. The terraces provide the local people with more than 90% of the food.

### **Ethnicity/Indigenous Population:**

The Hakka derive from the traditional Han people in the central mainland and is still an important division of the Han nationality today. In Hakka Terraces, Han nationality (the Hakka) accounts for more than 99% of the total population while the minority nationality (mainly She nationality) accounts for less than 1%.

Where Longji Terraces are located is a multi-nationality region, with the Zhuang and Yao nationalities as the majorities while Han, Miao and Dong nationalities as the minorities. In the proposed site, the population of Zhuang, Yao, Miao and Dong nationalities account for 84.5%, and the population of Han nationality accounts for 15.5%.

Ziquejie Terraces were once occupied by multi-ethnics including Yao, Miao, Dong and other nationalities in the history. Nowadays, they are dominated by Han nationality, but a lot of customs of those ethnic groups are still well inherited.

In Youxi Lianhe Terraces, the Han nationality occupies over 99% of the population while the minority nationality is mainly She nationality.

### **Summary Information of the Agricultural Heritage System:**

China has a very long history of constructing terraces that are famous for a wide scope of distribution and a large number of amount. Rice terraces are mainly distributed in the mountainous and hilly areas in the south of the Yangtze River. Some of the rice terraces are located in the middle and low reaches of the Yangtze River, which are in the third step of China's terrain and influenced by the subtropical monsoon climate that brings abundant rain. Chongyi Hakka Terraces, Longsheng Longji Terraces, Xinhua Ziquejie Terraces and Youxi Lianhe Terraces, recommended in this proposal, are typical representatives of the rice terraces in these areas. They are rich in biodiversity due to diversified planting modes and landscape patterns, therefore important to the global and national conservation of biodiversity. They are models of sustainable management of land and water resources in mountainous and hilly areas, providing important experiences for coping with the global ecological problems like land degradation, extreme droughts and floods caused by climate change. They are the co-adaptation results of different ethnic groups with distinctive natural conditions, forming diversified agri-cultures that are of great significance for the conservation of cultural diversity at both the global and national levels. In addition, they possess extraordinary aesthetic values due to the remarkable vertical landscape and changing scenery in different seasons. Although they share a lot of commons in food and livelihood security, biodiversity and ecosystem function, knowledge systems and adapted technologies, cultures, value systems and social organizations, landscapes, land and water resources management, the four rice terraces also show a great amount of differences in details that deserve careful reading and deep experiencing.



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# 1 Characteristics of the proposed GIAHS

## Global (or national ) importance

China has a very long history of constructing terraces that are famous for a wide scope of distribution and a large number of amounts. China is a mountainous country where the area of mountains accounts for about two-thirds of the total area of the territory. Therefore, to make a living, ancient people who lived in the mountainous area created the pattern of terraced fields according to local conditions. For hundreds of years, the terraces built along the mountains have not only improved the local farming conditions but also increased the output of grains. Moreover, they are beneficial to the ecology of the mountainous area and have made great contributions to the sustainable development of agriculture in China.

Despite of having a lot of mountains and hills, the southern provinces in China lack of plains to cultivate rice which requires a large area of water pool. To solve the problem of food, the ancient immigrants built terraced fields for water conservation which made it possible to grow rice in hilly areas. China's rice terraces are mainly distributed in the mountainous area in the south of the Yangtze River. In these areas, the rain is abundant and the mountains are distributed widely, so the terraces are constructed along the mountains. The rice terraces recommended here are respectively: Xinhua Ziquejie Terraces in Hunan Province, Longsheng Longji Terraces in Guangxi Province, Chongyi Hakka Terraces in Jiangxi Province and Youxi Lianhe Terraces in Fujian Province, all of which are typical representatives of rice terraces in southern mountainous and hilly areas of China (Figure 1-0-1).

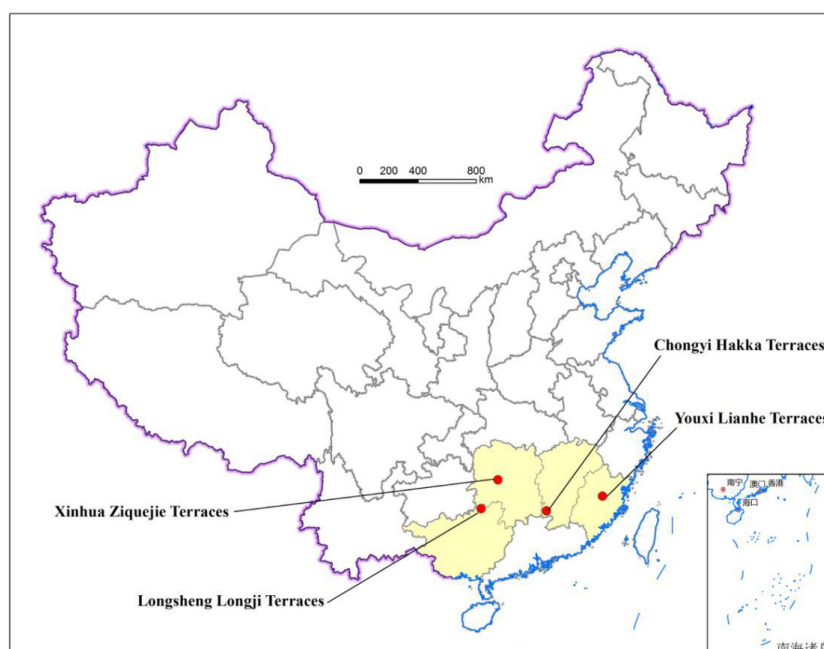
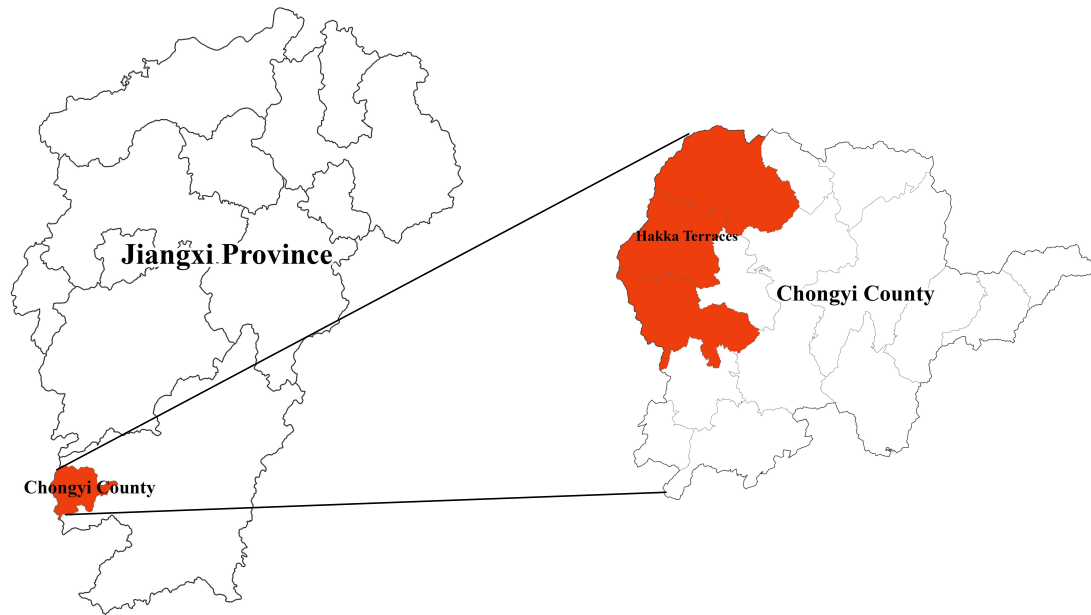


Figure 1-0-1 Location of the four recommended terraces in China

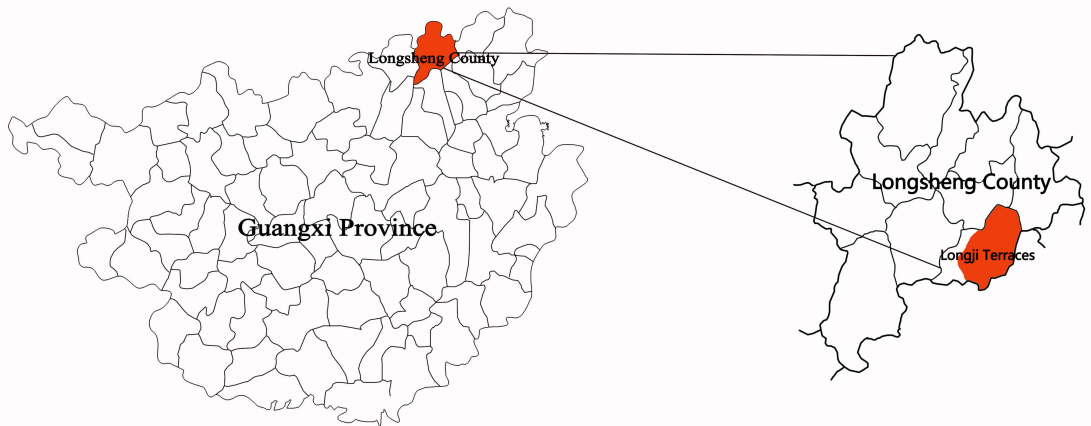
Chongyi Hakka Terraces are located in Chongyi County in the southwest of Jiangxi Province. The proposed site covers three townships of Shangbao, Sishun and Fengzhou, with a total of 26 villages

(Figure 1-0-2), an area of 521.15 km<sup>2</sup> and a population of 36,354 in 2015.



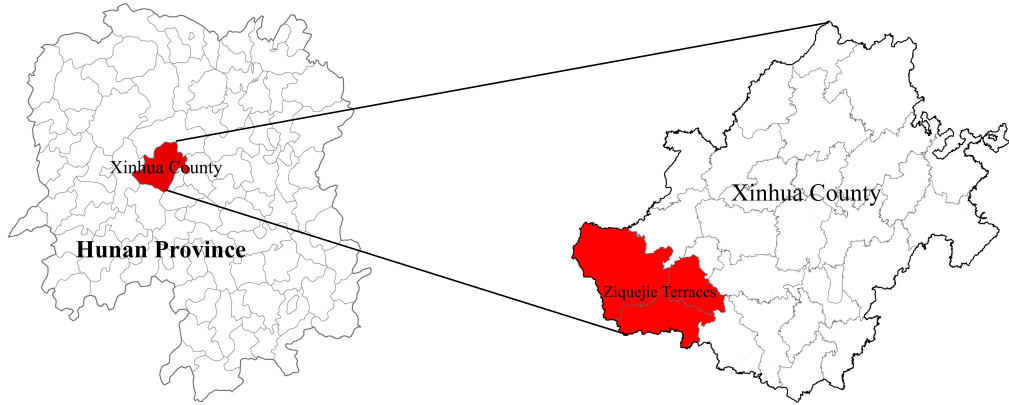
**Figure 1-0-2 Location of Chongyi Hakka Terraces in Jiangxi Province**

Longji Terraces are built along the slope winding from the foot to the top of Longji Mountains in Longsheng All-Nationalities Autonomous County, Guangxi Zhuang Autonomous Region. The proposed site covers the whole Longji Township (Figure 1-0-3). Its area is 237.70 km<sup>2</sup> comprised of 15 villages, including Ping'an Zhuangzhai, Longji Guzhaungzhai and Jinkeng Hongyaozhai. The population of the proposed site was 15,981 in 2015. In Longji Terraces, Zhuang and Yao nationalities are the majorities while Han, Miao and Dong nationalities are the minorities.



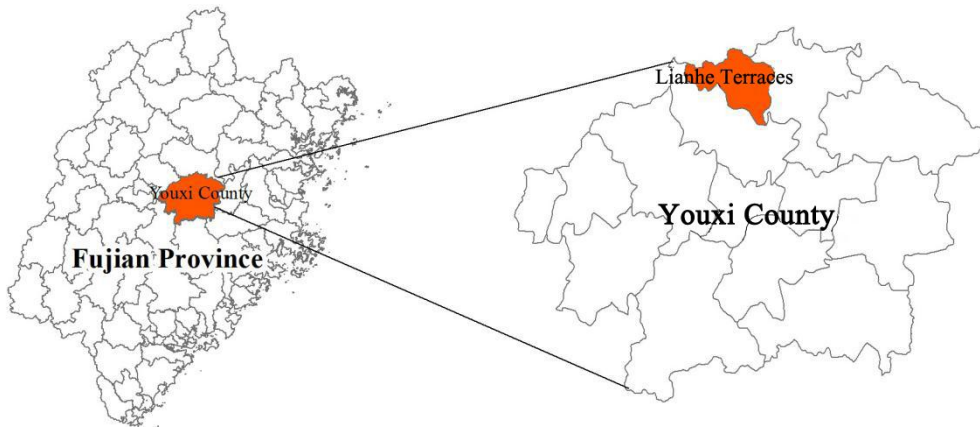
**Figure 1-0-3 Location of Longji Terraces in Guangxi Province**

Ziquejie Terraces is located at Xinhua County of Loudi City, Hunan Province, China. The proposed site covers three townships of Shuiche, Fengjia and Wentian, with a total area of 446.61 km<sup>2</sup>, comprised of 47 villages, and has a population of about 90,000 in 2015 (Figure 1-0-4)..



**Figure 1-0-4 Location of Ziquejie Terraces in Hunan Province**

Lianhe Terraces are located in Lianhe Township of Youxi County, Sanming City, Fujian Province, China. The total area of the proposed site covers 103.18 km<sup>2</sup> (Figure 1-0-5), comprised of 12 villages. The registered population in the proposed site was 22,000 in 2015. The Han ethnic group covers 99% of the population and the minority is mainly She ethnic group.



**Figure 1-0-5 Location of Lianhe Terraces in Fujian Province**

**Table 1-0-1 Coverage Information of the Four Terraces**

Name of Terraces	Area (ha)								
	Total	Paddy Fields	Dry Land	Garden	Forest	Grassland	Water	Construction Land	Other
Hakka Terraces	52,114.52	4,440.17	254.04	229.17	45,541.12	443.62	436.72	768.65	1.03
Longji Terraces	23,770.00	1,360.00	2,942.37	166.39	16,068.52	2427.86	283.51	499.14	22.21
Ziquejie Terraces	44,661.10	6,089.30	1,491.00	2,546.70	30,490.80	320.50	477.60	1,897.70	1,347.50
Lianhe Terraces	10,318.00	1,662.4	198.0	470.2	7083.2	354.4	70.5	424.3	55.0

The four rice terraces are all located in the third step of China's terrain (Figure 1-0-6). The third step of China's terrain is mainly comprised of plains and middle/low mountains and hills, most of which are below the altitude of 500 meters. In contrast, the average altitude of the second step is between 1,000 and 2,000 meters while that of the first step is above 4,000 meters. The four rice terraces are all located in the subtropical monsoon climate zone (Figure 1-0-7). The four rice terraces have four



distinct seasons in which the temperature varies greatly. Summer always brings high temperature and plenty of rain while winter always brings mild temperature and relatively less rain. According to the comprehensive regionalization of agriculture in China, the four rice terraces are all located in mountainous and hilly areas for forestry and agriculture in the middle and lower reaches of Yangtze River (Figure 1-0-8).

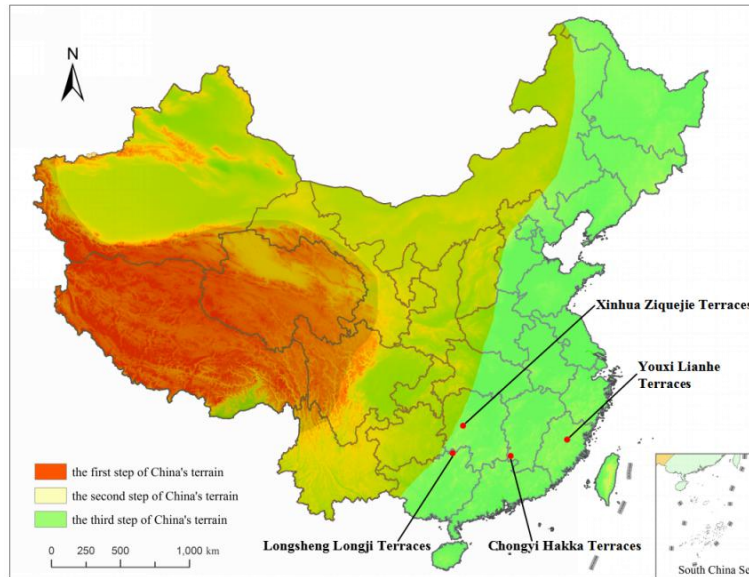


Figure 1-0-6 Location of the four recommended terraces in the three steps of China's terrain

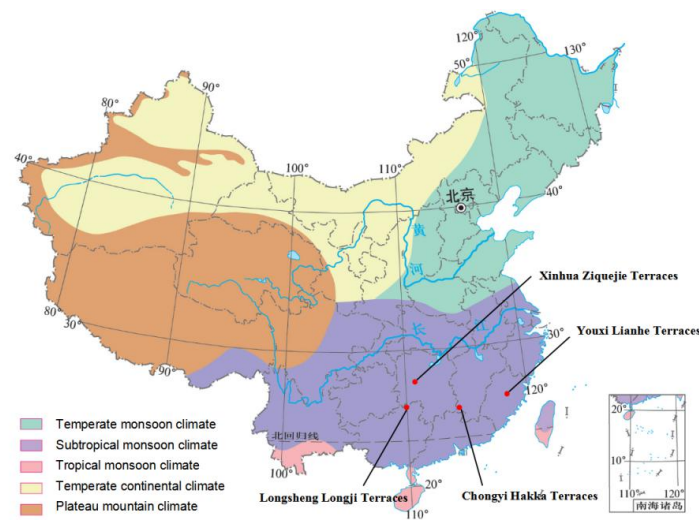


Figure 1-0-7 Location of the four recommended terraces in the climate zones of China



Figure 1-0-8 Location of the four recommended terraces in the agricultural regions of China

Since they are located in the same topographic area, climate zone and agricultural region, the four rice terraces share a lot of commons in food and livelihood security, biodiversity and ecosystem function, knowledge systems and adapted technologies, cultures, value systems and social organizations, landscapes, land and water resources management. This explains why they are incorporated into one system to jointly apply for GIAHS. However, they also show a great amount of differences in details as they are the co-adaptation results of different ethnic nationalities with specific-site environments. Their global and national importance is mainly represented in the following four aspects:

**First, due to diversified planting modes and landscape patterns, the four rice terraces are all rich in biodiversity.** They provide many different kinds of crops and animals, which contain a great number of traditional varieties that are important genetic resources. For example, an abundance of traditional rice varieties have been well conserved in these terraces, which are well adapted to the local environment and characterized as high-quality and rich in nutrients. Moreover, good natural environment and rich ecological resources have made these terraces become the habitat of rare animals and plants as well as a genetic pool of natural plants, animals and microbial. It is demonstrated that the four rice terraces are of great importance to the global and national conservation of biodiversity.

**Second, the four rice terraces, built on local topography, geology, soil, vegetation and water resource features, are models of sustainable management of land and water resources in mountainous and hilly areas.** The ancestors attached great importance to the protection of forests above the top terraces and created the effective natural gravity irrigation system, which have played an important role in the soil and water conservation in mountainous and hilly areas. The construction of these terraces has ingeniously solved the problem of water and soil erosion in mountainous and hilly areas and is still serving as a perfect solution to this problem in the modern society. It is demonstrated that the four rice terraces have provided important experiences for coping with the global ecological problems like land degradation, extreme droughts and floods caused by climate change.

**Third, the four rice terraces have formed a remarkable vertical landscape after the long evolution of the local people with the local environment.** The remarkable landscape is comprised of four key elements that are forests, terraced fields, villages and rivers from the top of the mountain to the bottom. Other elements like bamboo forest, tea garden, orchard combine together with the four key

elements displaying a large diversity in landscape and also the human wisdom on how to adapt to the nature. Besides the spatial difference, the landscape in these rice terraces also varies with time, displaying different scenery in different seasons. It is demonstrated that the four rice terraces have a high aesthetic value due to the unique spatial structure and the changing temporal characteristics of the landscape.

**Last but not least, in the four rice terraces different ethnic groups combined with distinctive natural conditions have developed diversified agri-cultures.** During the process of terrace construction and maintenance as well as rice cultivation, a great amount of traditional knowledge and adapted technologies have been applied and an abundance of festivals, customs, folklore, folk songs and farming proverbs have emerged. Moreover, some terraces are the places where different ethnic groups and different farming cultures converged in the history, therefore manifesting particular attributes and possessing important positions in the agri-culture of China. It is demonstrated that the four rice terraces have formed distinctive agri-cultures that are of great significance for the conservation of cultural diversity at both the global and national levels.

# 1.1 Food and livelihood security

## 1.1.1 Rice

### (1) Rice cultivation

The four rice terraces have played an important role in ensuring the food and livelihood security for the local people. Rice cultivation is the dominant cropping pattern in these regions and rice is the most important food for the local people. After meeting their own food need, local farmers usually sell the surplus rice to get a certain amount of income. Some of them further process rice to secondary products and get the income through sales.

In 2016, the total area of rice cultivation in Chongyi Hakka Terraces was 2,487.5 ha, which accounted for 53.0% of total cultivated land area. The total yield of rice in Hakka Terraces was 15,242 tons, and the ratio of the quantity of self-consumed and that of sale was 1.86:1 (Table 1-1-1). The price of the rice was around 2.6 yuan per kilogram.

**Table 1-1-1 The basic information of rice cultivation in Hakka Terraces in 2016**

Region	Area (ha)	Yield (tons/yr)	Sales revenue (yuan)
Hakka Terraces	2,644.2	15,242	$9.36 \times 10^6$

The primitive japonica rice had been grown in the Nanling Mountainous areas where Longsheng County is located 6 000-12 000 years ago, one of the source-lands of cultivated rice in the world. Rice is major crop of terraced farming, and a total food output was 5,000 tons including rice output about 4,288 tons (Table 1-1-2). The continued cultivation of rice in the system can ensure 0.411 tons grains per capital for more than 15,000 residents, thus food security of self-sufficiency has been realized.

**Table 1-1-2 The basic information of rice cultivation in Longji Terraces in 2015**

Region	Paddy field (ha)	Total output (ton)	Ratio of personal use (%)	Price (yuan/kg)	Sales (ton)	Income (yuan)
Longji Terraces	1360	4,288	70	3.0	122.6	$3.678 \times 10^5$

Ziquejie Terraces are located in a typical region for the cultivation of middle-season rice, with humid climate and suitable temperature. According to the official statistics data in 2015, the total area of rice cultivation in Ziquejie Terraces was 3,699 ha. The total yield of rice in the Ziquejie Terraces is 26,964 tons, among which around 15% is traditional rice, and around 85% is hybrid rice. Rice is the staple food for Ziquejie people. They use 10% of the traditional rice and 80% of the hybrid rice for their own food, and sell all the others to increase their income. The price of the traditional rice and hybrid rice is 7 yuan/kg and 3.5 yuan/kg respectively, thus the rice was sold for 42 million yuan in the Ziquejie Terraces (Table 1-1-3).

**Table 1-1-3 Planting area and yield of rice in Ziquejie Terraces in 2015**

Type	Area (ha)	Yield (ton)	Quantity of self-consumed (ton)	Quantity for sale (ton)	Price (yuan/kg)	Income (million yuan)
Traditional rice	554.8	4,044.6	404.5	3,640.1	7.0	25
Hybrid rice	3,144.2	22,919.4	18,335.6	4,583.8	3.5	16

In Lianhe Terraces, according to its statistical data of 2015, the cultivated area of rice was 873.1 ha, which covered 18.4% of the total cultivated area of the crops and yielded 5,582 tons of rice. The yields of the rice were 97.4% of the total cereal crops. According to surveys in 2015, local people consumed approximate 80% of the total amount of rice (Table 1-1-4). The self-consumption ratio is far higher than the mean value 58% of the Youxi County. The rest rice was sold for 3.01 million *yuan* for the local people. In sum, although the cultivated area of rice in Lianhe Terraces is very small due to the restriction from the landform, rice provides the main nutrient for the local people. As food, rice is more important to the core area than to the whole Lianhe Terraces.

**Table 1-1-4 Cultivated areas and yields of rice in Lianhe Terraces in 2015**

Region	Cultivated area (ha)	Yield (ton)	Price (yuan/kg)	Self-consumption ratio of the rice (%)	Sales revenue (million yuan)
Lianhe Terraces	873.1	5582	2.7	80%	3.01

## (2) Characteristics of traditional rice varieties

The long history of rice cultivation in the four rice terraces has formed unique local rice varieties. An abundance of traditional rice varieties have been well conserved in these regions, which are adapted to the local environment and characterized as high-quality and rich in nutrients.

There are many different traditional rice varieties in Chongyi Hakka Terraces, which including Dahezi rice, short-legged Dahe rice, red rice, black rice and so on (Table 1-1-5). These typical traditional rice varieties adapt to the local circumstances, with characteristics such as better-tasting and cold tolerance.

**Table 1-1-5 Characteristics of traditional rice varieties in Chongyi Hakka Terraces**

Variety name	Cultivated area (ha)	Yield (ton/ha)
Dahezi rice	200-266.7	6.75-7.5
short-legged Dahe rice	66.7-100	6-6.75
red rice	33.3-66.7	6.75-7.5
black rice	33.3-53.3	6.75-7.5
yellow husk glutinous rice (Huangkenuo)	200-333.3	7.2-7.65
Mazhannuo rice	173.3-200	7.5

These varieties also have different features. Dahezi rice and short-legged Dahe rice could grow with medium resistance to rice blast and sheath blight. Most of traditional rice are adapted to the climatic conditions in Hakka Terraces, with the characteristics of cold tolerance, in which Dahezi rice even grow in high altitude area around 1100m. There are high protein content and gel consistency in Dahezi rice and short-legged Dahe rice. Dahezi rice and short-legged Dahe rice are the raw material for



Huangyuan rice crackers. Black rice, Huangkenuo rice and Mazhannuo rice are the raw material for local mild wine.

Longji people have brought and successively cultivated traditional rice varieties, including 7 traditional rice varieties, especially Tonghe Rice, Longji Fragrant Glutinous Rice and Diling Red Sticky Rice (Table 1-1-6, Figure 1-1-1). These rice varieties are carefully selected by generation after generation's planting, year after year's cultivation, day after day's observation and each year of rice's comparison; they are also the masterpiece of "survival of the fittest in natural selection" as well as the lifeblood of local and surrounding villagers.

**Table 1-1-6 Characteristics of the typical traditional rice varieties in Longji Terraces**

Name of varieties	Characteristics of varieties	Cultivated area(ha)
Tonghe Rice	Tonghe Rice, Longji Fragrant Glutinous Rice and Diling Red Sticky Rice have characteristics of large panicle and large grains, thin hulls with awn, strong resistance, wide adaptability, high protein content, less white belly, excellent quality and high aroma of "One cook and plenty of families can smell its fragrance". The color of Diling Red Sticky Rice is dark red and this kind of rice adapts to the local natural environment.	253.33
Longji Fragrant Glutinous Rice		
Diling Red Sticky Rice		



Tonghe Rice



Longji Fragrant Glutinous Rice



Diling Red Sticky Rice

**Figure 1-1-1 Traditional rice varieties in Longji Terraces**

Subtropical monsoon climate with adequate water and heat is suitable for rice growth; the cold water on high mountains is only suitable for the growth of glutinous rice; Magu cold water glutinous rice, the most popular species grown by the Longji people ancestors, but its seeds had been missing since hybrid rice was extended; With the traditional varieties of the traditional family, such as the Tonghe Rice and the Longji Fragrant Glutinous Rice and the Diling Red Sticky Rice, the planting area still has nearly 253.33 ha, accounting for about 40 percent of the total area of rice cultivation. Followed by the father of hybrid rice Yuan Longping scientists scientific research cutting, agricultural technology department through the "first test, after the promotion", Shanyou Gui 99, ZhongZheyou 1, ZhongZhe 8 and other series of constantly updated hybrid rice variety of acreage reached 400 ha, accounting for 60% of the total area of rice planting.

There are 8 traditional rice varieties cultivated in the Ziquejie Terraces, including Baisha Glutinous rice, Yunnong Glutinous rice and No.1 Jing Glutinous rice, Maguhong rice, black tribute rice, black rice, purple scented rice and red rice (Table 1-1-7). Among them, the black tribute rice and red rice are two most distinctive and popular planted traditional rice varieties in the Ziquejie Terraces (Figure 1-1-2).

**Table 1-1-7 Characteristics of the traditional rice varieties in Ziquejie Terraces**

Name of varieties	Characteristics of varieties
Black tribute rice	Black tribute rice is characterized by dwarf plant and cold-resistant features; however it has the relative low yield of only 250-300 kg/mu. It is a kind of round rice with dark and bright brown colors, which has intense flavor, soft and delicious taste. Since it is rich in selenium, the black tribute rice can help to build stronger kidneys.
Red rice	Red rice has long stalks and is characterized by cold-resistant and excellent disease resistance features, but it is susceptible to lodging and has the relative low yield of 200-250 kg/mu. The planting area that is most suitable for red rice is mountainous area with the altitude of more than 800 meters. The red rice is a kind of slender rice with crystal clear color and soft and delicious taste. With high glutinous content and rich iron element, the red rice has amazing blood tonic function.
Baisha Glutinous rice	Baisha Glutinous rice is very waxy. It grows above 600 meters above sea level and has long stalks of 140-150 cm. It is characterized by fertilizer Intolerance, Lodging resistance, and excellent disease resistance features. Its yield is 200-250kg/ mu.
Yunnong Glutinous rice	Yunnong Glutinous rice is also very waxy. It grows below 800 meters above sea level and has long stalks of 130-140 cm. It is characterized by fertilizer Intolerance and compact branches. It's a traditional rice variety introduced from other place in 1970s. The yield is 300-350kg/mu.
No.1 Jing Glutinous rice	No.1 Jing Glutinous rice is also very waxy. It grows below 800 meters above sea level and has long stalks of 110-120 cm. It is characterized by fertilizer tolerance, Lodging resistance, and Strong tillering ability. It's a traditional rice variety introduced from other place in 1980s. The yield is 400-500kg/mu.
Magu red rice	Magu red rice grows above 600 meters above sea level and has long stalks of 140-150 cm. It is characterized by fertilizer intolerance, susceptible to lodging, and low tillering ability. The yield is 200-250kg/mu.
Black rice	Black rice is a kind of special varieties formed by long term cultivation of Gramineae rice. The appearance of rice grain is oblong, the rice husk is grey brown, and the grain has two types, including indica and japonica. According to the taste, the grain can be also divided into waxy and non-glutinous. Black rice has rich nutrient. It can be used as food, medicine, or wine.
Purple scented rice	Purple scented rice has purple leaves, purple and scented grains. It grows below 800 meters above sea level and has stalks of 100-105 cm. It is characterized by fertilizer intolerance, medium resistance to rice blast, and low tillering ability. The yield is 300kg/mu.



Black tribute rice

Red rice

**Figure 1-1-2 The black tribute rice and red rice in the Ziquejie Terraces**

Traditional rice varieties in Ziquejie Terraces are of high quality and rich in nutrients (Table 1-1-8). In addition to being consumed as staple food, most of the traditional rice varieties are processed into secondary products or made into a variety of liquor products for sales. On the one hand, the traditional rice cultivation meets part of the food needs of local farmers; on the other hand, it also increases the income of local farmers through the sales of secondary products.

**Table 1-1-8 Main trace element components in the black tribute rice of Ziquejie Terraces**

Main Nutrients	Hybrid Rice (mg)	Black Tribute Rice of Ziquejie Terraces (mg)	Black Tribute Rice of Ziquejie Terraces/ Hybrid Rice
Selenium	0.015	0.041	173%
Iron	4.8	16.72	248%
Calcium	64	138.55	116.5%
Zinc	13	23.63	81.8%

The traditional rice variety resources and conventional hybrid rice varieties in Youxi Lianhe Terraces are abundant. So far, there are 72 traditional rice varieties reserved and 84 hybrid rice varieties in Lianhe Terraces, which have to the largest extent guaranteed the local food safety.

Hybrid rice varieties and traditional rice varieties both have their advantages and disadvantages. For example, Hybrid rice varieties have low adaptivity to the micro climates in the area with different altitudes and barren soils, and also are not directly used as seeds. The traditional rice varieties in Lianhe terraces can fully meet the requirements on rice cultivation in different altitudes and seasons and ensure the year-round production of Lianhe Terraces. In addition, the traditional rice varieties usually have stronger disease resistance than the hybrid rice, but most of them also have some defects such as weak lodging resistance, poor palatability.

At present, a hybrid rice is far larger than the local traditional rice in cultivated area, but some traditional rice varieties still play an important role in local people' daily living. Hongqushu, Shajing and Heinuomi are the three largest traditional rice varieties in cultivated area in Lianhe terraces, which are all about 4 ha, respectively. Hongqushu as a necessary material is used to brew the traditional rice wine. Shajing and Heinuomi are favored for their good tastes. Heinuomi also has affluent nutrient elements, which are more than 2 times of white hybrid rice in the cuprum, manganese and zinc content according to research.

The three kinds of traditional rice had a similar price each other, and were higher than the hybrid rice, but their yields were lower than the hybrid rice according to the statistical data of Lianhe Terraces

in 2016 (Table 1-1-9). In general, as far as the earning per unit area is concerned, the traditional rice is not largely different from the hybrid rice. If the traditional rice prices increase, their cultivated area may rise.

**Table 1-1-9 Typical traditional rice varieties in Lianhe Terraces in 2016**

Typical varieties of rice	Cultivated area (ha)	Yield (kg/ha)	Price (yuan/kg)
<i>Oryza sativa</i> ‘Hongqushu’	4	280-320	7-7.5
<i>Oryza sativa</i> ‘Shajing’	4	280-320	7-7.5
<i>Oryza sativa</i> ‘Heinuomi’	4	280-320	7-7.5

## 1.1.2 Other food and materials

In addition to rice cultivation, these terraces also produce wheat, corn, beans, potatoes, oil crops, herbs, vegetables and fruits through rotation or full use of dry land nearby. Almost all the households raise a different number of poultry and livestock to provide meat, eggs and other related products to enrich their foods and nutrition. Local farmers also utilize rice paddies to raise shrimps, snails, crabs, fish and ducks, therefore obtaining an abundance of aquatic products. Forest resources are also very rich in these terraces, providing a lot of timber, herbs, foods and other forest products for the local people. Beside selling these food and materials directly, local farmers also process these diversified food and materials to secondary products, thus increasing their income through the sales.

### (1) Other crops

Chongyi Hakka Terraces provide many different kinds of food, including wheat, maize, millet, sorghum, beans, potatoes and other grain crops, as well as a variety of oil crops, vegetables, melons and fruits. The main oil crops are peanut, rapeseed and sesame. Vegetables and edible fungi include leaf vegetables, Chinese cabbages, cabbages, root vegetables, gourds, solanberries and so on. Fruits are mainly citrus, pears, peaches and grapes (Table 1-1-10).

**Table 1-1-10 The sown area and yields of special food in Chongyi Hakka Terraces in 2015**

Category	Area (ha)	Yield (ton/yr)
Grain crops	27,999	10,533
Oil crops	1,774	324
Vegetables	3,723	4,419
Fruits	2,210	841
Total	35,706	16,117

Raised in Longji Terraces are not only rice, but also tea, *Momordica grosvenori*, alpine vegetables, fruits, among others, with mountain forest terrace compound management, according to the different soil zones at different elevations. Under the independent acclimatization in a very closed environment, over 30 agricultural species resources with unique regional features have been established such as Longji pepper, Longji tea (Table 1-1-11), all of which have been certified as "National Geographical Indication Agri-Products" by the Ministry of Agriculture of China. Owing to the good protection of ecological environment, many plant resources grow on this land, including fruit trees like pear, plum, red bayberry, citrus, loquat, blueberries, medicinal plants like *Eucommia bark* and Amur

cork-tree bark, oil-bearing crops like camellia and tung oil tree, crops like sweet potato, taro, corn and pepper, and so on.

**Table 1-1-11 The production of other crops in Longji Terraces in 2015**

Category	Area (ha)	Total output (ton)	Value (million yuan)
Corn	281	1245	0.8715
Bean	40	133	0.396
Potato	293	973	2.09
Peanut and rape	62	110	0.81
Mahogany fruit	468	76.11 (million objects)	38.05
Tea	113	320	7.9
Pepper	260	3900	117
Vegetables	766	10862	181.61
Melon fruit	12	718	1.25
Fruits	159	2479	6.38
Edible fungus	16	328	8.27

In addition to rice, Ziquejie people also plant wheat, corn, beans, potatoes, oil crops, herbs, vegetables and fruits, etc. (Table 1-1-12) Local farmers are good at making use of local resources. The plantation of a variety of crops guarantees the food security in this region from generation to generation.

**Table 1-1-12 The production of other crops in the Ziquejie Terraces in 2015**

Type	Area (ha)	Yield (ton)	Quantity for sale (ton)	Price (yuan/kg)	Income (million yuan)
Wheat	62	185.00	185.00	2	3.70
Corn	1,123	6,425.00	1,285.00	2	25.70
Other cereals	35	450.00	360.00	10	36.00
Beans	196	423.00	211.50	6	12.69
Tuber crops	910	4,429.00	1,328.70	2	26.57
Oil crops	646	736.00	588.80	6	3.53
Herbs	743	8,328.00	8,328.00	10	832.80
Vegetables	619	10,921.00	6,552.60	5	32.76
Melons	29	1,226.00	735.60	4	2.94
Other crops	1,058				

Other than rice, there are so many other crops which have larger cultivated areas and more yields in a year in Lianhe Terraces. As demonstrated in Table 1-1-13, soybean, sweet potato, potato and corn are also important food for the local people; peanut and soybean are the main sources of local edible oil; taro, water spinach, Chinese cabbage, leaf mustard, melon and fruit growing in the terrace system provide food materials for the local people.



**Table 1-1-13 The sown area and yield of other main crops in Lianhe Terraces in 2015**

Category	Sown area (ha)	Yield (ton)
Corn	45.8	140
Sweet potato	275	1,275
Potato	199.4	736
Soybean	767.3	1,559
Peanut	109.5	350
Chinese cabbage	166.9	5,036
Cabbage	131.3	3,979
Cucumber	41.9	1,266
White turnip	59.5	2,220
Taro	110.7	3,849
Ginger	70.9	2,012
Cauliflower	69	2,309
Leaf mustard	217.7	7,923
Watermelon	44.9	1,346

## (2) Poultry, livestock and aquatic products

The main varieties of animal husbandry are pig, cattle, sheep, poultry (chicken, duck, goose and pigeon), and rabbit in Hakka Terraces (Table 1-1-14). According to a preliminary investigation, there are 9 families of fish including Cyprinidae, Cobitidae, Siluridae, and so on. Reptiles, crustaceans and shellfish are also bred in local ponds. Aquatic products reached a total of  $6.55 \times 10^3$  tons, with  $6.15 \times 10^3$  tons of aquatic products and 435 tons of fishes in 2016. The output of aquatic products was 87.5 million yuan in 2016, which included 4.5 million yuan from fish selling.

**Table 1-1-14 The livestock and poultry breeding situation in Chongyi Hakka Terraces in 2016**

Types	Total amount	Amount of livestock on hand	Quantity of sale
Pigs	27,522	10,478	17,044
Cattle	7,312	5,431	1,882
Sheep	2,887	944	1,943
Poultry	313,040	156,480	156,560
Rabbit	5,478	2,351	3,127
Total	356,238	175,683	180,555

There are also abundant endemically bred livestock such as swine, cattle, sheep, chicken, duck, goose, bamboo rat, giant salamander in Longji Terraces. The Phoenix Chicken and Green Jade Duck (Table 1-1-15) have been certified as "National Geographical Indication Agri-Products" by the Ministry of Agriculture of China, and the outcome of animal husbandry accounts for about 21.39% of the total industrial.

**Table 1-1-15 The basic situation of poultry, livestock and aquatic products in Longji Terraces in 2015**

Types	Total output	Value (million yuan)
Poultry	Including 94000 chickens, 53100 ducks, 1700 geese and so on, the number of all poultry are up to 158797	6.52
Livestock	Including 7900 pigs, 100 horses, 2700 cattle, 700 goats, 5300 rabbits, and so on	24.56
Aquatic products	77 tons	0.88

In addition to the cultivation of different crops, almost all the rural households in the Ziquejie Terraces raise a different number of poultry and livestock to provide meat, eggs and other related products to enrich their foods and nutrition. Ziquejie Terraces provided 7315 tons of meat and 181 tons of egg in 2015 (Table 1-1-16). Fish, shrimp and other aquatic organisms, wild or raised by farmers in paddy fields, ponds and rivers, are also the important food sources for local farmers.

**Table 1-1-16 Poultry and livestock farming in the Ziquejie Terraces in 2015**

Type	Stocks	Sales/ Slaughtered
Pig ( $\times 10^4$ )	6.44	9.74
Cattle( $\times 10^4$ )	1.39	0.78
Sheep ( $\times 10^4$ )	0.76	0.87
Poultry ( $\times 10^4$ )	28	53

In Lianhe Terraces, animals are also main sources of livelihood. Ducks, chickens, pigs, rabbits and goats are the most important domestic animals (Table 1-1-17), which are also the significant income sources and the primary sources of food proteins for local people. The cattle are mainly used for ploughing, but are also used as food when they can not plow due to aging. Besides, the animals symbiotic with crops in farmland such as carps, loaches and shellfish like escargots are also the food materials.

**Table 1-1-17 The amounts of poultry, livestock and aquatic products in Lianhe Terraces in 2015**

Category	Animal types	Core area of Lianhe Terraces	
		Stock	Sales/slaughtered
Poultry	Chickens	25943	50110
	Ducks	56031	59091
Livestock	Pigs	16600	29974
	Cattle	96	35
	Goats	1493	3276
	Rabbits	22041	33208
Aquatic products	Freshwater		
	Fish (ton)	-	118

### (3) Forest products

Chongyi Hakka Terraces also provide a lot of forest products (Table 1-1-18). Chongyi mountain tea is a famous green product, with a planting area of 1376.6 ha. In 2016, there was  $3.1 \times 10^4$  ha of

bamboo, including 4700 ha of Mao bamboo. There are 33 taxus nursery bases with an area of 1450 ha.

**Table 1-1-18 The planted area of main forest products in Chongyi Hakka Terraces in 2016**

Items	Area (ha)
Tea	1,376.6
Bamboo	31,000
Mao Bamboo	4,700
Taxus	1,450

In addition, the climate of Chongyi is suitable for the growth of citrus tree. Navel orange production in proposed site is abundant, with 312.5 tons in Shangbao Township, 2500 tons in Sishun, 1208.7 tons in Fengzhou in 2016. In recent years, with the development of the agricultural economy, there are many special products planted in large-scale, including spine grape, south jujube, taxus seedlings and oil-tea camellia (Table 1-1-19, Figure 1-1-3).

**Table 1-1-19 Special agricultural products in Chongyi Hakka Terraces in 2016**

Region	Scale of special agricultural industry
Sishun	1,168 of ha oil tea; 30 ha of Shangzhi brier grape
Shangbao	366.6 ha of tea, including 200 ha of Chishuixian
Fengzhou	6.67 ha of yacon ; 7.8 ha of cantaloupe; 22.4 ha of tea



Shangbao "Chishuixian" organic tea

Chongyi navel orange

Qi Yunshan" jujube cake

**Figure 1-1-3 Special agricultural products in Hakka Terraces**

The Longji Terraces is located in the mid-subtropical ever-green vegetation zone, with 79.1% forest coverage rate, the vegetation types in the mountains being diversified, displaying an organic agglomeration of over 1,000 plants such as arbors, bamboo (Table 1-1-20, Figure 1-1-4), bushes, grasses, ferns and mosses, and constituting a perfect forest vegetation system and a complete forest ecosystem, and the outcome of forestry accounts for about 26.09% of the total industrial.

**Table 1-1-20 The basic situation of the production of forest products in Longji Terraces in 2015**

	Wood	Bamboo	Food (bamboo shoot)	Other Economic forest
Area (ha)	167	120	120	230
Total output	8,910 cubic meters	343,000 objects	94 tons	Tung oil seed about 34 tons, camellia seed about 240 tons, Chinese gall about 5 tons, palm sheet about 23 tons, and anise about 7 tons
Value (million yuan)	10.16	4.11	5.64	12.05



Chinese gall

Bamboo shoot

Longji Tea

Tung oil

**Figure 1-1-4 Food produced in the forest of Longji Terraces**

There are rich forest resources in the Ziquejie Terraces. The total forest land area is about 30,490.8 ha for the proposed site. There are 1.11 million m<sup>3</sup> of forest volume, and 0.54 million m<sup>3</sup> of timber volume, of which most are firs and masson pines. Economic forests mainly consist of honeysuckle, tea-oil tree, Chinese chestnut, *Eucommia ulmoides* olive and tea trees, with a total area of 800 ha. *Phyllostachys pupescens* is one of the important forest resources in local area. Its total area is around 6,022 ha with 11.75 million *Phyllostachys pupescens* plants. These important forest resources provide a lot of timber, herbs, foods and other forest products for local farmers (Figure 1-1-5).



**Figure 1-1-5 Forest products in Ziquejie Terraces**

Local people in Lianhe Terraces also get food from forestry by the way of collecting or hunting and woods from forestry by lumbering. For example, the forest system above the terraces provides fungus such as *lentinus sajor-caju*, *auricularia auricula-judae*, wild herbs and wild animals, as well as woods; the bamboo forest provides local people with bamboo shoots for eating and bamboos for weaving all the year round; artificial tea garden and orchard provide tea, oil-tea seeds, fruits and so on (Figure 1-1-6). In Lianhe Terraces, there were main 10 kinds of products from the forestry. Of which, the woods, wild plants and fruits were the three kinds of the most important products from the forestry and were more than other products according to the statistical data of 2015 (Table 1-1-21). These food and woods are critical raw materials of local traditional food and industrial production, constituting an integral part of local livelihood.



Black fungus

Bamboo shoot

Tea

Oil-tea

**Figure 1-1-6 Food produced in the forest of Lianhe Terraces**

**Table 1-1-21 Yields of the products from Forestry in Lianhe Terraces in 2015**

Category	Tea Garden		Orchard Garden		Forest above terraces					
Products	Tea (ton)	Oil-tea seeds (ton)	Citrus (ton)	Pears (ton)	Bamboo shoots (ton)	Woods (m <sup>3</sup> )	Rosin (ton)	Twitch-grass (ton)	Wild Plants (ton)	Wild animals (ton)
Yield	988	431	5298	149	297	50767	253	523	10351	100

### 1.1.3 Economic contribution

Agriculture has played a very important role in maintaining the livelihood of the local people and promoting the development of the local economy in the four rice terraces systems. Statistical data showed that agriculture has contributed a lot to the local GDP and is still one of the most important sources of the income of local farmers.

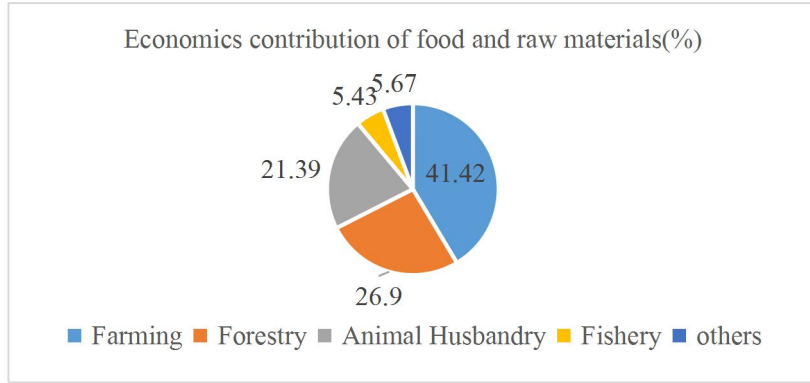
Statistical data show that there were 7917 farmers in Chongyi Hakka Terraces in 2015. The percentages of farmers account and the total employment in Shangbao, Sishun and Fengzhou Townships were 48.1%, 51.8% and 42.2% respectively in 2015 (Table 1-1-22). According to the demarcation of the three sectors, 58% of rural households get income from primary industry, 28.2% from secondary industry and 13.8% from tertiary industry in 2015. Ratio of income of agriculture, forestry, animal husbandry and the fishery was 28.7:44.3:9.3:17.7. The data also show that planting is the main source of the farmer income in Chongyi. Village collective income and individual farmer income has kept growing in these years. In 2015, the village economic revenue was 1,357 million yuan, and the farmer per capita income was 8,515 yuan.

**Table 1-1-22 Employees in Chongyi Hakka Terraces in 2015**

Region	Total Employees	Agricultural employees	Industry employees	Agricultural employment rate (%)
Sishun	6,522	3,139	408	48.13
Shangbao	5,528	2,865	1,971	51.83
Fengzhou	4,530	1,913	1,554	42.23

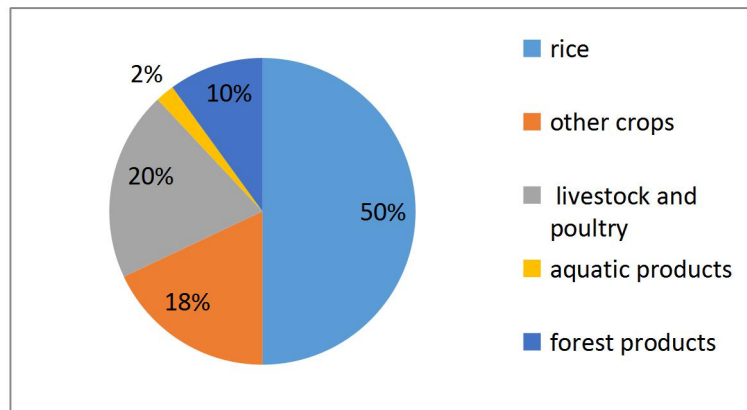
Agricultural production has been the important source of food and income for the residents in Longji Terraces. In 2015, its gross agriculture production is about 209.23 million *yuan*, of which farming production accounted for 41.42%, forestry output accounted for 26.9%, animal husbandry output value accounted for 21.39%, fishery output value accounted for 5.43% (Figure 1-1-7). A national level traditional agro-system integrating the terraces sightseeing, leisure travels, folk culture hand-on experiences and scenic resources protection has been formed in the Longji Terraces, with the Longji terraces as an important resource for the agricultural and tourism incomes of the Longji town. And in 2016, the gross output value of farming, forestry, animal husbandry and fishery reached 250.31 million *yuan*, up 19.6% compared with last year.





**Figure 1-1-7 Economic contribution of food and raw materials in Longji Terraces**

The Ziquejie Terraces system is one of the traditional agricultural areas. Agriculture and husbandry is the main sources of income for local farmers. Staple food and vegetables for local people are mainly supplied by the Ziquejie Terraces. The revenue from agriculture and husbandry accounts for one-third of the total income of farmers. The income from rice accounts for 50% of that from agriculture and husbandry, other crops for 18%, livestock and poultry for 20%, aquatic products for 2%, and forest products for 10% (Figure 1-1-8).



**Figure 1-1-8 Composition of agricultural incomes in Ziquejie Terraces in 2015**

Agricultural production in Lianhe terraces is still an important source of farmers' income, though some farmers go out as migrant workers or go into business. For example, the gross output value of Lianhe terraces' agricultural products reached 347 million *yuan* in 2015, of which the output value of agriculture was 224.88 million *yuan*, that of forestry was 47.90 million, that of animal husbandry was 70.64 million *yuan*, that of fishery was 1.82 million *yuan* and that of agriculture, forestry, animal husbandry and fishery service was 2.62 million *yuan* (Table 1-1-23). The farmers enjoyed 6,046 *yuan* of a net per capita income in 2015.

**Table 1-1-23 Composition of agricultural incomes in Lianhe Terraces in 2015**

Category	Gross Output value	Agricultural Output value	Forestry Output value	Animal husbandry Output value	Fishery Output value
Amount (million <i>yuan</i> )	347	224.88	47.9	70.64	1.82

Other than agriculture, the magnificent terraced scenery and the time-honored temple “Taming Tiger Cliff” of Lianhe Terraces as well as various kinds of special farming food are all superior tourism resources, which attracted 96,000 tourists in 2015 and 120,000 tourists in 2016, respectively. Tourism workers accounted for more than 5% of the permanent population, with the per capita income reaching 1,500 *yuan*. Tourism solves the employment and bread-and-butter issues of local people to some extent. Besides, weaved or carved handicrafts with bamboos and wood in the mountain also bring some profits for local farmers.

## 1.2 Biodiversity and ecosystem function

### 1.2.1 Biodiversity

#### (1) Agricultural biodiversity

The four rice terraces are rich in agricultural biodiversity. They provide many different kinds of crops, which contain a great number of traditional varieties that are important genetic resources. They also provide a variety of animal resources.

#### 1) Diversified crop resources

Many varieties of rice grow in Chongyi Hakka Terraces. Thirteen traditional rice varieties (see [Annex 1- Schedule 1-1](#)) are still being planted, including red rice, Dahezi rice, yellow husk glutinous rice, black rice, short-legged Dahe rice, and so on. Apart from rice, there are 22 varieties of other food crops, such as yam, corn, sorghum, triticites, millet and beans (see [Annex 1- Schedule 1-3](#)) (partly shown in [Figure 1-2-1](#)).

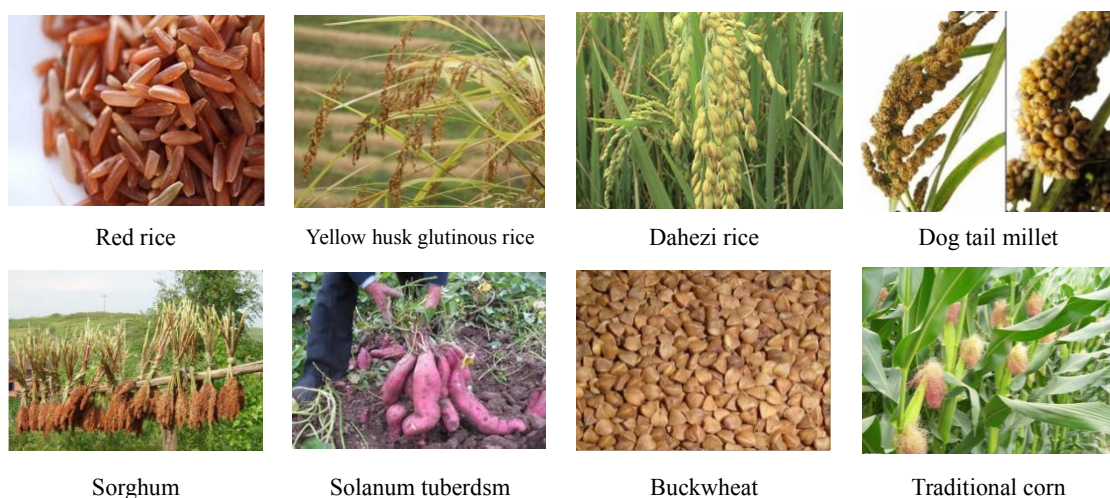


Figure 1-2-1 Some of the food crops grown in Chongyi Hakka Terraces

Some other varieties in Hakka Terraces are partly shown in [Figure 1-2-2](#) (see [Annex 1- Schedule 1-3](#)). There are 8 varieties fiber crops with cotton and hemp fiber. Oil crops have 9 species, mainly including oil seed rape, sesame, tea-oil tree and peanut. Sugarcane is the major local sugar-yielding crop, which has 2 varieties. Tobacco is also a local crop. There are 10 kinds of vegetables, including Chinese cabbage vegetables, root vegetables, solanaceous vegetables, melons vegetables, kale vegetables, legume vegetables, leafy green vegetables, tuber vegetables, onion garlic vegetables and aquatic vegetables. These vegetables include many varieties such as *Amorphophallus rivieri*, *Lagenaria siceraria var. hispida*, *Sechium edule*, *Pachyrhizus erosus*, *Ipomoea aquatica* Forssk and *Begonia fimbristipulata*. Fruits are mainly *Citrus reticulata* Blanc, *Citrus reticulata* Blanco cv. Ponkan, *Citrus*

*sinensis* Osbeck, *Myrica rubra* (Lour.) S. et Zucc, *Eriobotrya japonica* (Thunb.) Lindl, *Punica granatum* L and other 13 varieties. Of them, *Vitis davidii* and *Choerospondias Axillaris* are the featured fruits varieties in Chongyi. There are 13 kinds of tea, including bitter tea, arbor wild tea, yangling xiumei tea, niedu bitter tea and longgui tea.



**Figure 1-2-2 A selection of farm crops in Chongyi Hakka Terraces**

There are 26 local crop varieties, including Indica Yellow millet, Chicken-feet millet, Dog-tail millet, china grass, Yellow millet, jute, konjak, bottle gourd, yam beam, bitter tea and sweet tea (see [Annex 1– Schedule 1-4](#)).

Because of the subtropical monsoon climate with adequate water and heat, a lot of traditional and introduced crops are feasibly cultivated in the ecosystem of Longji Terraces, including some crops like indigenous rice (Tonghe Rice and Fragrant Glutinous Rice series), sweet potato, taro, corn and pepper ([Table 1-2-1](#), [Figure 1-2-3](#)).

**Table 1-2-1 The basic situation of diversified crop resources in Longji Terraces**

Crops	Traditional varieties	Introduced varieties
Rice	Horse-tail glutinous, Red Su Glutinous, Home Tonghe, Bleached Round, Rongpabai, White Home Glutinous, white dou glutinous, red fragrant glutinous, tonghe glutinous rice;	Rice: Guangxuan 3, Red Rose Early, Unit 1, Shanyou 63, Xinhei 9, Honglisimiao
Corn	Early Corn;	White Horse Teeth, Du'an 2, Guidan 16, Taizhen, Guangxi Sweet 566, Guangxi Glutinous 518, Jade Beauty Head 602
Others	Sweet potato: Redskin Yellow-core, Whiteskin White Core, Areca-Nut; Pepper; Tea; Mahogany fruit	Sweet potato:64-283





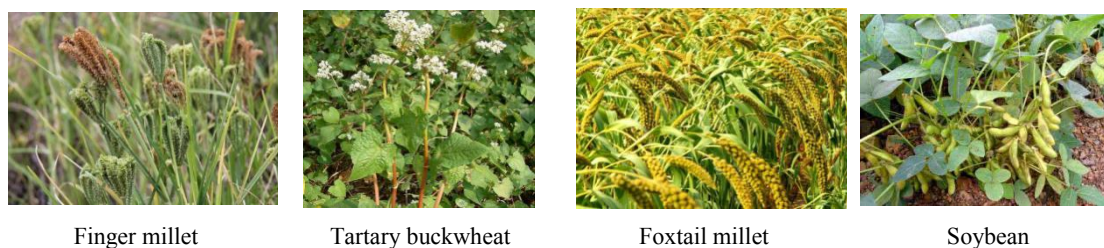
**Figure 1-2-3 Main crops in Longji Terraces**

There are 8 traditional rice varieties cultivated in the Ziquejie Terraces, including Baisha Glutinous rice, Yunnong Glutinous rice and Jing No.1 Glutinous rice, Maguhong rice, black tribute rice, black rice, purple scented rice and red rice (Figure 1-2-4, see Annex 3- Table 1). There are also about 150 hybrid rice varieties.



**Figure 1-2-4 Traditional rice varieties in the Ziquejie Terraces**

In addition to these rice varieties, there are also lots of other crops planted in the Ziquejie Terraces, including corn, potatoes and beans. Many of them are traditional varieties, including finger millet, foxtail millet, tartary buckwheat, soybean, black bean, rice bean, green bean, broad bean and potatoes. Oil crops planted there mainly include oilseed rape, tea-oil tree and peanuts (Figure 1-2-5). There are different vegetables, such as cabbage, radish, carrot, celery, squash, peppers, and so on. There are also many fruits, such as chestnut, bayberry, grapes, loquat, grapefruit, and so on. In addition, different kinds of herbal plants are also planted in this region (See Annex 3- Table 2).



Finger millet

Tartary buckwheat

Foxtail millet

Soybean

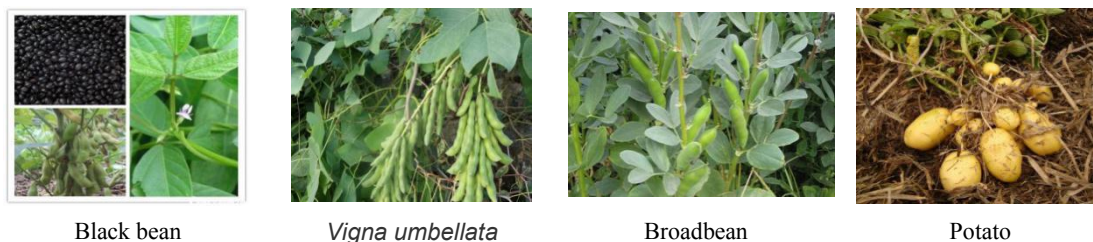


Figure 1-2-5 Some crops in the Ziquejie Terraces

The traditional rice germplasm resources in Lianhe terraces are abundant, and embody Youxi people’s wisdom in seed selection and breeding. So far, there are 72 varieties of traditional paddy rice reserved in Lianhe terraces. These traditional rice varieties include garnet, Youxi red, cold waterdrop, huzao, dwarf white, Youxi grain, white jade grain, dark rounded grain and red husk grain (Figure 1-2-6) and other varieties (see Annex 4-Table 1). While preserving a lot of traditional rice varieties, The core area also developed 84 kinds of hybrid rice (see Annex 4-Table 2). Other crop germplasm resources in Lianhe Terraces are also rich. There are 123 varieties of other crops growing in terraces, among which 27 belong to food grains, 21 oil-bearing crops, 44 vegetables, 4 green manure crops, 7 commercial crops, 10 fruit trees, and 10 edible mushrooms (see Annex 4-Table 3).



Figure 1-2-6 Traditional rice varieties in Lianhe Terraces



## 2) Diversified animal resources

Main species of livestock in Chongyi Hakka Terraces including pigs, cattle, goats, rabbits, dogs, cats, chickens, ducks, geese and pigeons (Figure 1-2-7, see Annex 1- Schedule 1-5). There are a total of 66 varieties of livestock and poultry in Hakka Terraces. Pigs have 12 varieties, cattle 5, goats 10, rabbits 7, chickens 5, ducks 10, pigeons 5, bees 2, cats 5 and dogs 5. The traditional livestock include traditional spotted pig, yellow cattle, traditional chicken, traditional duck and another 10 kinds (see Annex 1- Schedule 1-6).

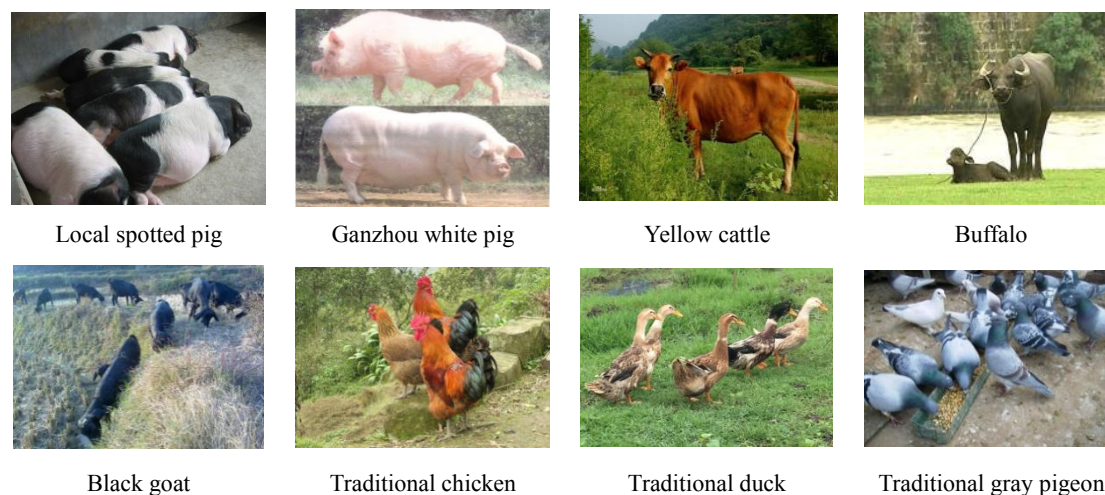


Figure 1-2-7 A variety of livestock in Chongyi Hakka Terraces

The Hakka undertake aquaculture in reservoirs, pools and lakes. Fish culture in paddy fields is a representative way of ecological farming with varieties of *Cyprinus carpio*, *Carassius auratus* and *Misgurnus anguillicaudatus* (Cantor). According to preliminary survey, local cultivated fish totally has 28 species including *Cyprinidae*, *cobitidae* and *siluridae*. Reptiles, crustaceans and shell-fish are also cultivated (see Annex 1- Schedule 1-5). Reptiles mainly include *Trionyx sinensis*, *Rana catesbeiana* and *Rana grylio*. Crustaceans include *macrobranchium nipponense*, *palaemonetessinensis*, and *potamidae*, and shell-fish include *corbiculafluminea* and *procambarus clarkii* (partly shown in Figure 1-2-8).

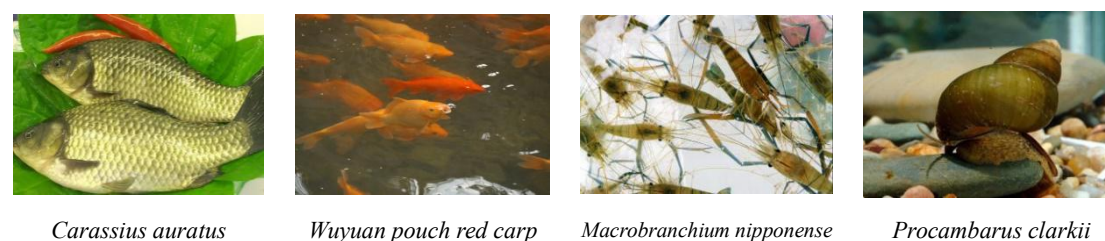


Figure 1-2-8 Some fishery resources in Chongyi Hakka Terraces

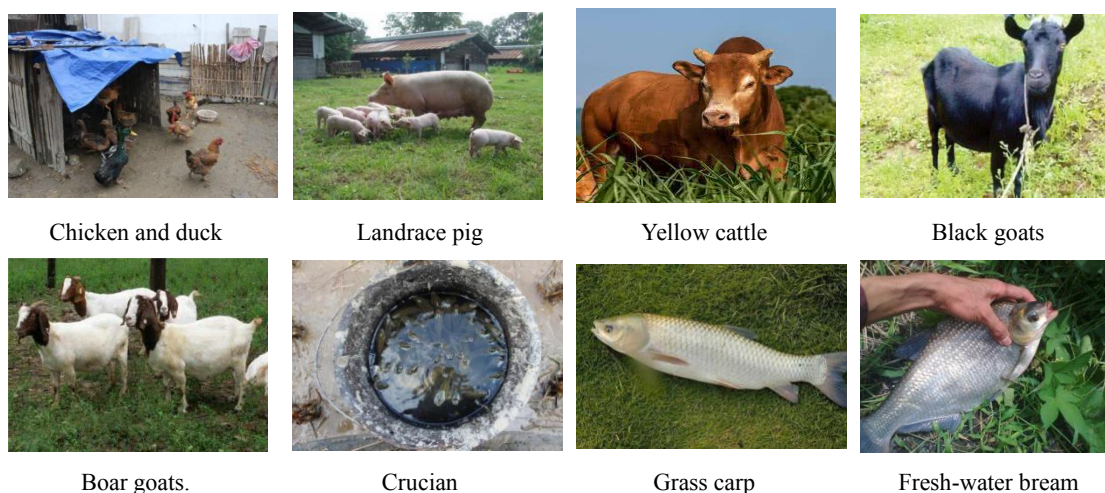
Due to its well preservation, the ecosystem of Longji Terraces offers good food resources and feeding place for the local animal husbandry; moreover, its good ecological environment produces the animal resources with the local special features, in addition to abundant endemically bred livestock such as swine, cattle, sheep, goose, dog, horse, rabbit, bamboo rat, giant salamander and poultry such as

Phoenix Chicken and Green Jade Duck, some aquatic products and other special species living in the Longji terraces.



**Figure 1-2-9 A variety of livestock in Longji Terraces**

Many varieties of livestock like chickens, ducks, pigs, cattle and sheep are also extensively farmed in the Ziquejie Terraces (Figure 1-2-10, see Annex 3- Table 3). The chicken varieties include three Yellow Hair Chicken, Barred Plymouth Rock chickens, laying hens, and black-bone chicken. The duck varieties include Shaoxing duck, southern egg-laying duck, and Beijing ducks. Pig varieties include Landrace pig, Large Yorkshire, Duroc, Xiangxi Black pig, Ningxiang pigs, and DLY (Hybrids of Duroc, Landrace and Large Yorkshire). Cattle varieties include Xiangnan Yellow cattle, Xiangxi Yellow cattle, hybrids of Angus cattle and local cattle breeds, hybrids of Lee Limousin and local cattle breeds, and hybrids of Simmental Beef Cattle and local cattle breeds. Goat breeds include Black goats and Boar goats. The Ziquejie Terraces are also rich in diversity of aquatic organisms, including fish, shelled animals, Amphibians, mollusks, insects and other aquatic organisms. Among them, there are 23 fish species, including crucian, grass carp, cyprinoid fish, fresh-water bream and *Parabramis pekinensis* (see Annex 3- Table 4).



**Figure 1-2-10 Some animals in the Ziquejie Terraces**

In Lianhe Terraces, there are 10 species of livestock and poultry raised by local people. The 10 species cover 35 breeds which includes 5 breeds of pigs such as Huai pig and Eastern Fujian spotted pig, 6 breeds of rabbits such as Chinchila rabbit and rex rabbit, 3 breeds of goat like Daiyun goat, 1 breed of dairy cattle, 2 breeds of farm cattle, 3 breeds of dogs, 7 breeds of chickens like Youxi local chicken and ginkgo white chicken, 3 breeds of ducks like shanma duck, 3 breeds of geese like

lion-head goose and 2 breeds of pigeons.

Lianhe Terraces have retained the rice-animal symbiotic cropping pattern, such as “shrimp farming in paddy”, “escargot farming in paddy”, “crab farming in paddy”, “fish farming in paddy” and “dark breeding in paddy”. In general, 12 species of animals keep symbiotic with rice, including 6 species of fish like loach, monopterus, grass carp and carp, 3 species of shrimps like prawn and *macrobrachium*, 2 species of conches like Mudsail (*cipangopaludina cahayensis*) and 1 species of crab (See [Annex 4- Table 3](#)).

## (2) Associated biodiversity

Diversified planting modes and landscape patterns have increased the diversity of species in the terraces considerably, which contributes to the control of diseases, pests and herbs and the reduction in chemical fertilizer and pesticide application. Good natural environment and rich ecological resources has made these terraces become the habitat of rare animals and plants, and become a gene pool of natural plants and animals.

### 1) Plants

Chongyi Hakka Terraces boast extremely abundant ecological resources and biodiversity, which constitute a natural gene bank of flora and fauna in the subtropical zone. By the end of 2015, there have been a total of 2,844 species of higher plants under 1,031 genera in 270 families in this area (partly shown in [Figure 1-2-11](#)). Three species are under Level-I National Key Protected Wild Plants, including *Taxus mairei* (lemeé et Lévl) S Y Hu, *Bretschneidera sinensis* Hemsl, *Ginkgo biloba* L. Fourteen species are under Level-II National Key Protected Wild Plants, including *Alsophila mertteniana*, *Cinnamomum rigidissimum*, *Castanopsis concinna*, *Fagopyrum dibotrys*, *Fokienia hodginsii*, *Cinnamomum camphora*, *Magnolia officinalis* subsp. *Biloba*, *Toona ciliata* var. *pubescens*, *Camptotheca acuminata* Decne, *Glycine soja*, *Semiliquidambar cathayensis*, *Phellodendron chinense* var. *Glabriusculum*, *Eurycorymbus cavaleriei*, *Cibotium barometze* (see [Annex 1- Schedule 2-1](#)). Twenty species are recorded in *China Plant Red Data Book* (the first batch in 1999), among them, 1 species is endangered, 9 species vulnerable, and 10 species rare (see [Annex 1- Schedule 2-2](#)). As many as 76 species are listed in *the Appendix of CITES (2007)*, among them, the orchidaceae family is the most common (see [Annex 1- Schedule 2-3](#)). Twenty species fall in *the IUCN Red List (2007)*, among them, 5 species are endangered, 8 species vulnerable, 7 species low risk, (see [Annex 1- Schedule 2-4](#)). In total, 88 species are listed in *the China Species Red List (2007)*. Among them, 13 species are endangered, 37 species vulnerable, 38 species under threatened (see [Annex 1- Schedule 2-5](#)).



*Taxus mairei*



*Bretschneidera sinensis*



*Ginkgo biloba* L



*Alsophila mertteniana*





*Camptotheca acuminata* Decne      *Eurycorymbus cavaleriei*      *Pieris japonica*      *Spathoglottis pubescens*

**Figure 1-2-11 A portion of endangered wild plants in Chongyi Hakka Terraces**

Chongyi County was one of "Ten Bamboo Counties in China" that was nominated by Chinese Ministry of Forestry in 1996. It is abundant in bamboo resources (partly shown in Figure 1-2-12), mainly belonging to 23 species, such as *Ph. edulis* (Carr.) H. de Lehai, *I. tessellatus* (Munro) Keng f, *Dendrocalamus latiflorus* Munro, *Pleioblastus amarus* (Keng) Keng f, *Bambusa ventricosa* McClure et al (see Annex 1- Schedule 2-6). In addition, Chongyi County is also rich in pharmaceutical plants, the number of which has grown up to 57 spices, mainly including *Rehmannia glutinosa* Libosch, *Pinellia ternata*, *Typhonium giganteum*, *Lonicera japonica*, *Paris polyphylla*, *Broadleaf Mahonia*, etc. (see Annex 1- Schedule 2-7).



*Ph. edulis* (Carr.) H. de Lehai      *I. tessellatus* (Munro) Keng f      *Dendrocalamus latiflorus* Munro      *Bambusa ventricosa* McClure  
*Rehmannia glutinosa* Libosch      *Pinellia ternata*      *Typhonium giganteum*      *Lonicera japonica*

**Figure 1-2-12 A portion of wild plants in Chongyi Hakka Terraces**

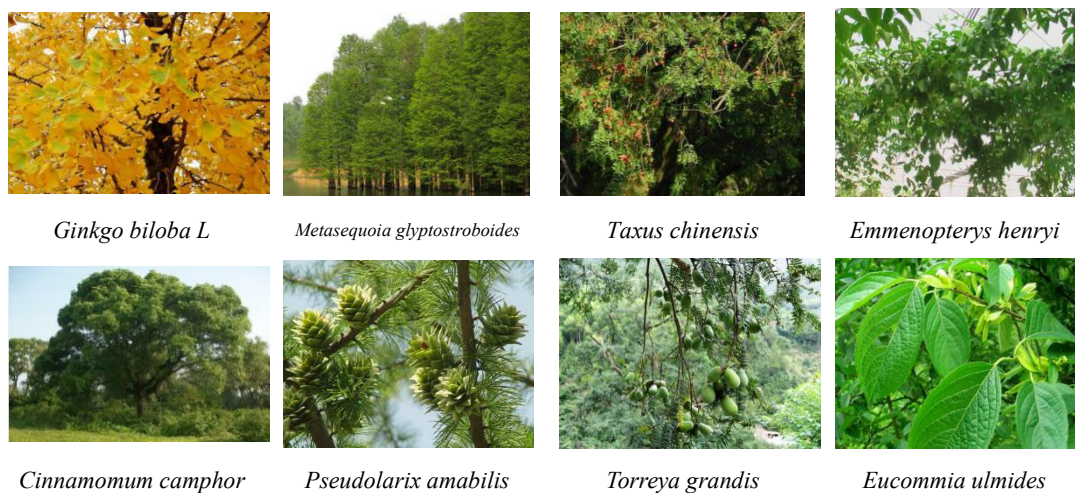
In the exploitation of the resources of the Longji Terraces by the local peoples, most of the mountainous areas have been conserved in their original forms for only the slopes with thick surface soils have been plowed, and abundant primeval forests have been protected in cutting slopes into steps-like terraces in the name of guarding the holy mountains and head-water forests. Under such a way of using resources, the ecological status has remained intact, a good forest vegetation has been formed with an organic habitation of more than a thousand of plant species such as pepper, *Momordica grosvenori*, alpine vegetables ,fruit trees like pear, plum, red bayberry, citrus, loquat, blueberry, medicinal plants like *Eucommia* bark and *Amur cork-tree* bark, *Mangnolia officinalis* bark and *Lysimachia foenum-graecum* Hance ,oil-bearing crops like camellia and tung oil tree ,beverage type plants like tea tree and *Momordica grosvenori*, wild vegetable varieties like bamboo shoots, bracken, water celery, *Houttuynia cordata* and duck feet vegetable (*artemisia lactiflora* root) spice plants like octagon and Chinese prickly ash, ornamental plants like azalea and orchid, 2 national first-class protected tree species--*Taxus chinensis var mairei* and *Metasequoia glyptostroboides*, 6

national second-class protected tree species--*Cyathea spinulosa*, *Ginkgo biloba*, *Phoebe bournei*, etc, medicinal plants like *Eucommia bark* and *Amur cork tree bark* (Figure 1-2-13, see Annex 2).



**Figure 1-2-13 Plant resources in Longji terraces**

There are 933 plant species belonging to 258 genera in 99 families in the Ziquejie Terraces. Among them, five plant species belong to class I national protected plants, including *Ginkgo biloba*, *Metasequoia glyptostroboides*, *Taxus chinensis*, *Taxus mairei*, and *Bretschneidera sinensis*; eleven species belongs to class II national protected plants, including *Pseudolarix amabilis*, *Emmenopteryx henryi*, *Cercidiphyllum japonicum* and others, and four species belongs to class III national protected plants, including *Tapiscia sinensis* Oliv, *Pteroceltis tatarinowii* and others (Figure 1-2-14, see Annex 3-Table 5).



**Figure 1-2-14 Wild plants in Ziquejie Terraces**

There are 672 species of plants (see Annex 4-Table 4) in the compound system consisting of forests, villages, terraces and rivers in Lianhe Terraces, among which many plants can be found in the four subsystems at the same time.

According to investigation statistics, there are 458 species of plants in forest sub-ecosystem, among which 147 are trees, 72 bushes, 15 woody climbers, 184 herbaceous plants, 18 ferns and 6



bryophytes; 285 species of plants are in village sub-ecosystem, including 60 trees, 33 bushes, 149 herbaceous plants, 13 herbaceous climbers, 23 ferns and 7 bryophytes; 208 species of plants are in stream sub-ecosystem, including 43 trees, 51 bushes, 8 woody climbers, 12 herbaceous climbers, 73 herbaceous plants, 14 ferns and 7 bryophytes.

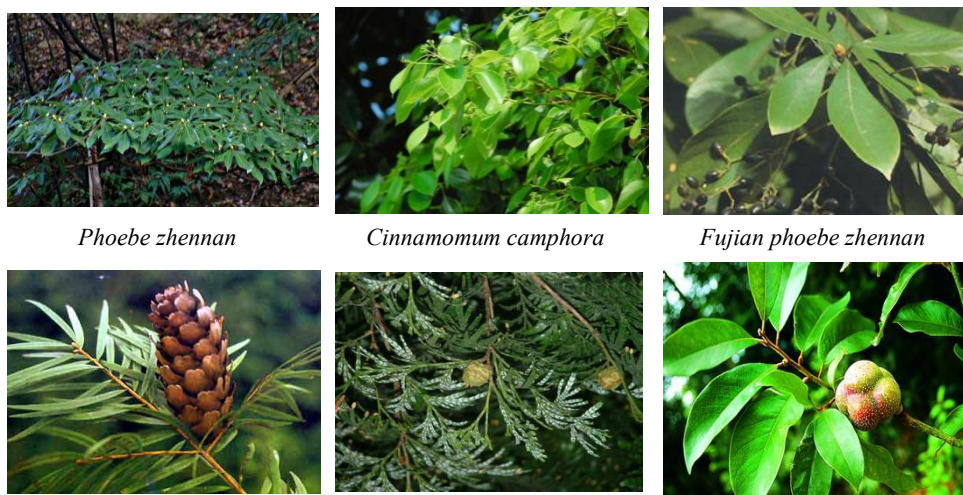
Lianhe Terraces have nursed plenty of rare species resources. They possessed 2 species of the first class national protected plants, i.e. *cibotium barometz* and *taxus chinensis* (Figure 1-2-15); 7 species of second class national protected plants, i.e. *phoebe zhennan*, *cinnamomum camphora*, *tsoongiodendron odorum*, *Fujian phoebe zhennan*, *gingko*, *keteleeria fortunei* and *Fujian cupressaceae* (Figure 1-2-16); 3 species of third class national protection plants, i.e. *coptis chinensis*, *mangnolia hypoleuca* and *magnolia officinalis*; 9 species of Fujian provincial protected plants, i.e. *Fujian cyclobalanopsis chungii*, *Fujian michelia*, *Fujian cerasus serrulata*, *keteleeria fortunei*, *cryptomeria fortunei*, *podocarpus macrophyllus*, *cephalotaxus sinensis*, *cinnamomum camphora* and *phyllostachys bambusoides*.



*Taxus chinensis*

*Cibotium barometz*

**Figure 1-2-15 First class national protected plants in Lianhe Terraces**



*Phoebe zhennan*

*Cinnamomum camphora*

*Fujian phoebe zhennan*

*Keteleeria fortunei*

*Fujian cupressaceae*

*Tsoongiodendron odorum*

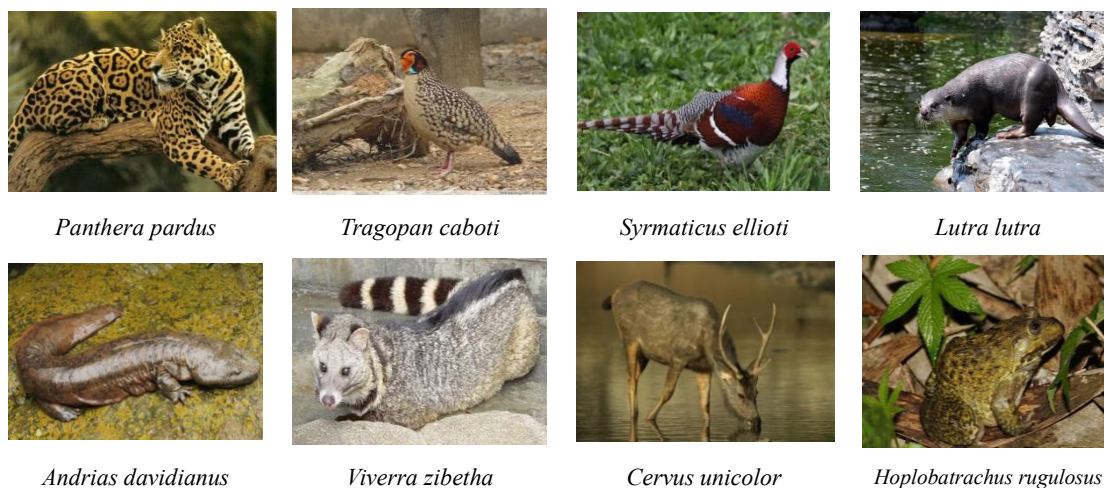
**Figure 1-2-16 Second class national protected plants in Lianhe Terraces**

## 2) Animals

There are 1,350 species of invertebrates and 394 species of vertebrates belonging to 101 families in 34 orders in Chongyi Hakka Terraces (partly shown in Figure 1-2-17). Six species are under Level-



I National Key Protected Wild animals, such as *Panthera pardus*, *Cervus nippon kopschi*, *Python molurus*, *Tragopan caboti*, *Syrmaticus ellioti*, and 50 species are under Level- II National Key Protected Wild animals (see [Annex 1- Schedule 2-8](#)), including *Catopuma temminckii*, *Panthera pardus*, *Capricornis sumatraensis*, *Hoplobatrachus rugulosus*, *Manis pentadactyla*, *Lutra lutra*, *Viverricula indica*, *Viverra zibetha*, *Cervus unicolor*, *Andrias davidianus* et al. Twenty-five species are listed in *China Red Data Book of Endangered Animals (1998)* (see [Annex 1- Schedule 2-9](#)). The endemic species of China are very plentiful with 27 species (see [Annex 1- Schedule 2-10](#)).



**Figure 1-2-17 A portion of rare and endangered wild animals in Chongyi Hakka Terraces**

In the Longji terraces, there are 2 kinds of first-class national protected wild animal species--*Python molurus* and *Moschus berezovskii*, 29 kinds of second-class national protected wild animal species--*Syrmaticus ellioti*, *Andrias davidianus*, *Echinotriton asperrimus*, *Hoplobatrachus chinensis*, *Geoemyda spengleri*, etc, and 38 kinds of provincial-class protected wild animal in Guangxi species--*Muntiacus reevesi* *Ogilby*, *Muntiacus Crinfrons Sclatar*, etc. ([Figure 1-2-18](#), see [Annex 2](#)).



**Figure 1-2-18 Wild animal species in Longji terraces**

There are 41 species of animals listed as national protected animals in the Ziquejie Terraces. Among them, 2 animal species belong to class I national protected animals, namely the clouded leopard

and python; thirteen animal species belongs to class II national protected animals, including Macaque, Pangolins, otters, large Viverra and others, and twenty-six animal species belongs to class III national protected animals, including fox, yellow weasel, and others (Figure 1-2-19, see Annex 3- Table 6).

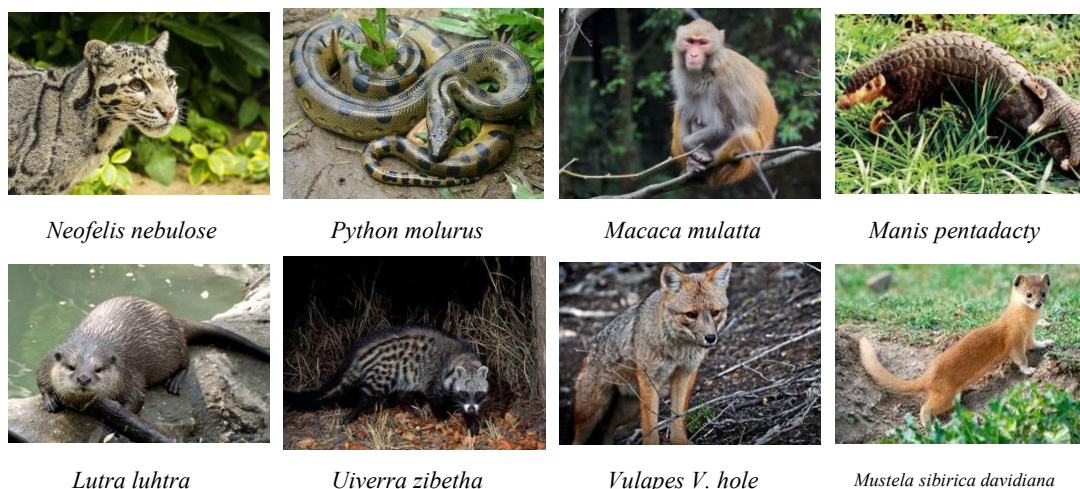
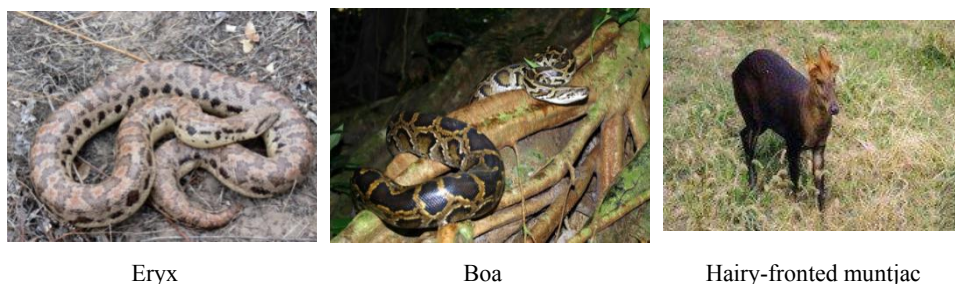


Figure 1-2-19 Wild animals in Ziquejie Terraces

There are 166 species of animals (see Annex 4-Table 5) in the forest, village, terrace and river compound system of Lianhe Terraces. Some species of them usually live in several different sub-ecosystems.

There are 123 species of animals in forest sub-ecosystem, including 49 species of invertebrates and 74 species of vertebrates both of which are mainly carnivorous and rodent animals, and 63 species of animals in village sub-ecosystem, including 29 invertebrates and 34 vertebrates, and 75 breeds of animals in stream sub-ecosystem, including 37 vertebrates and 38 invertebrates.

In the forest sub-ecosystem of Lianhe Terraces, there are 5 species of first class national protected animals, i.e. *eryx*, *boa*, hairy-fronted *muntjac*, clouded *leopard* and *deinagkistrodon*; 12 species of the second class national protected animal, i.e. jackal, tiger frog, Bonelli's Eagle, *spilornis*, Eurasian sparrowhawk, northern goshawk, black eagle, greater coucal, common kestrel, otter, macaque and pangolin; 28 species of third class national protected animals including hedgehog, *fejervarya limnocharis*, asiatic toad, *sinonatrix annularis*, rice paddy snake, *trimeresurus*, porcupine, wild boar, hedgehog, etc.; 7 Fujian Province-level protection animals, such as cormorant, Chinese hwamei, long-eared owl and oriental turtle dove (Figure 1-2-20).



Eryx

Boa

Hairy-fronted muntjac



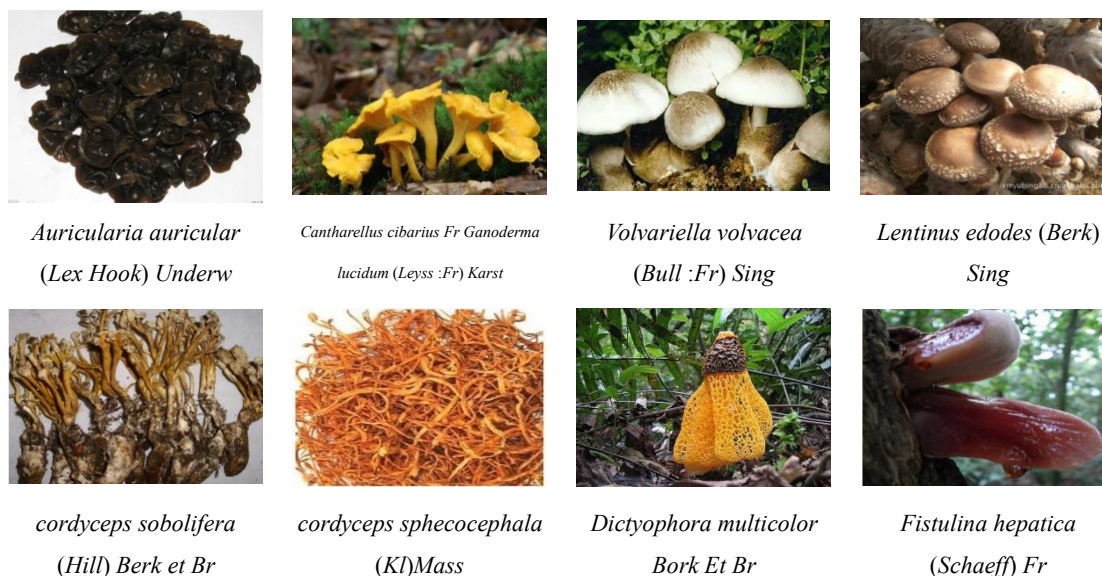


Figure 1-2-20 National protected animals in Lianhe Terraces

### 3) Microbial

There are a great number of microbial resources in Chongyi Hakka Terraces, which fall into 182 species under 87 genera in 40 families. (partly shown in [Figure 1-2-21](#)). They include 6 species of commonly-seen large edible fungus, such as *Auricularia auricular* (Lex Hook) Underw, *Cantharellus cibarius* Fr, *Ganoderma lucidum* (Leyss: Fr) Karst, *Lentinus edodes* (Berk) Sing, *Volvariella volvacea* (Bull: Fr) Sing, *Agaricus silvaticus* Schaeff Ex Fr, *Agrocybe chaxingu huang*, and 20 species of large rare local fungus (see [Annex 1- Schedule 2-11](#)), such as *Auricularia auricular* (Lex Hook) Underw, *Agrocybe chaxingu huang*, *Cantharellus cibarius* Fr, *Ganoderma lucidum* (Leyss: Fr) Karst, *cordyceps nutans* Pat, *cordyceps sobolifera* (Hill) Berk et Br, *cordyceps sphecocephala* (KI) Mass, *Ganoderma tsunodae* (yasuda) Imaz, *Calostoma cinnabararium* (Desv) Mass, *Calostoma japonicum* PHenn,

*Fistulina hepatica* (Schaeff) Fr, *Dictyophora multicolor* Bork Et Br, *Lycoperdon pusillum* Batsch: Pers.



**Figure 1-2-21 A few of the large fungi in Chongyi Hakka Terraces**

Longji Terraces are located in the subtropical monsoon climate zone, the hot and humid weather is suitable for the growth of some wild fungi, especially some edible fungi, such as *Lactarius deliciosus*, also known as pine mushroom, shaped like umbrella, flesh red, fitting for growing in the dark and humid place, and locating in the bushes or under the trees with a very high nutritional value, including anti-cancer, beautifying, anti-aging and improving immunity and other functions. This mushroom is delicious and is the only one can not artificially cultivate wild mushrooms; Huapi mushroom whose surface has a layer of sticky liquid, feeling like slippery, and mainly grown in the wasteland under the thorns with a fascicular attribute; *Nostoc commune* is a combination of fungi and algae which living in the dark, and is suitable for soup; there are letinous edodes, mushroom, fungus, *Lentinus edodes*, *Nostoc commune* and other more common edible fungi in this area (Figure 1-2-22).



**Figure 1-2-22 Microbial resources in Longi Terraces**

There are a great number of microbial resources in Ziquejie Terraces. Among them, fungus is the most important ones for the daily life of local farmers. The commonly cultivated fungus in the Ziquejie Terraces includes *Lentinus edodes* (Berk. ) Sing, *Auricularia auricula* (L. Ex Hook.), *Pleurotus ostreatus* (Fr.) Kummer, *Pleurotus eryngii*, *Flammulina velutiper* (Fr.) Sing, *Agaricus bisporus*, and



others. The commonly wild fungus in the Ziquejie Terraces includes *Lactarius deliciosus*, *Ganoderma lucidum* (Leys. Ex Fr.) Karst., *Nostoc commune* Vaucher, *Auricularia delicata* (Fr.) Hem, and others (Figure 1-2-23).



**Figure 1-2-23 Fungi resources in Ziquejie Terraces**

Youxi Lianhe Terraces have a great many microorganisms. A total of 27 species of common microorganisms (see Annex 4-Table 6) lives in the Lianhe Terraces. Likewise, some of them can be found in several different sub-ecosystems. For example, all the 27 species of common microorganisms inhabit in forest sub-ecosystem, and of which 7 species of common microorganisms are also live in village sub-ecosystem. The characteristic and precious microorganisms are like *Dictyophora indusiata*, *Hericium erinaceus*, *Tricholoma matsutake*, etc. (Figure 1-2-24)



**Figure 1-2-24 Characteristic microorganisms in Lianhe Terraces**

## 1.2.2 Ecosystem functions

### (1) Water conservation

The canopy and soil of the forest above these terraces are able to conserve water in a powerful way and effectively regulate the spatial and temporal distribution of rainwater. On rainy days, the forest ecosystem on the top part of the mountain can retain part of the rainwater, which will decrease the surface runoff and weaken the flood peak of rivers. Meanwhile, in the dry season, the water conserved by the forest will infiltrate gradually into the terraces to meet the water demand of terrace crops. The soil of terraces can also conserve water to some extent and guarantee the water demand of varieties of plants in the ecosystem.

Using the alternative method of shadow engineering, the water conservation amount of each sub-system in Chongyi Hakka Terraces has been estimated. As shown in Table 1-2-2, paddy fields can store 652 million cubic meters of water in a year, the water conservation amount of dry land is  $37.3 \times 10^6$  m<sup>3</sup>/yr, that of garden land is  $33.7 \times 10^6$  m<sup>3</sup>/yr, woodland sums up to  $6.69 \times 10^9$  m<sup>3</sup>, and grassland is  $6.52 \times 10^7$  m<sup>3</sup>. As a result, the total water conservation amount of Chongyi Hakka Terraces reaches  $7.48 \times 10^9$  m<sup>3</sup>/yr (Table 1-2-2).

**Table 1-2-2 The average amounts of water conservation of different landuse type in Chongyi Hakka Terraces**

land use type	Area (ha)	Amount (m <sup>3</sup> /yr)
Paddy field	4,440.17	$6.52 \times 10^8$
Dryland	254.04	$3.73 \times 10^7$
Grassland	443.62	$6.52 \times 10^7$
Garden	229.17	$3.37 \times 10^7$
Forest	45,541.12	$6.69 \times 10^9$
Total	50,908.12	$7.48 \times 10^9$

The vegetation on both sides of Longji Terraces are well conserved, and the evergreen forest vegetation such as arbors, bushes and grasses are distributed in the cubic climate formed at different elevations, high coverage of vegetation with 79.1% forest coverage rate, following the various contours of the mountains, which is beneficial to the water and soil conservation. Forests can conserve the water source, counteract the flood peak, extend the water supply time and quantity (release the drought). As its good forest coverage and terrace conditions are conducive to water conservation, there can be found 1360 hectares of paddy fields for preserving  $9.22 \times 10^5$  tons water and 16068.52 hectares of forest for conserving  $1.09 \times 10^7$  tons water in Longji Terraces by calculation. These data shows that forest and arable land are so important for the protection of the Terrace's water resources (Table 1-2-3).

**Table 1-2-3 Water conservation amount in Longji Terraces in 2015**

Ecosystem	Area (ha)	Water conservation amount (m <sup>3</sup> /yr)
Paddy field	1,360	$9.22 \times 10^5$
Dry land	2,942.37	$4.32 \times 10^8$
Garden land	166.39	$2.44 \times 10^7$



Forest	16,068.52	1.09×10 <sup>7</sup>
Grass land	2,427.86	3.57×10 <sup>8</sup>
Total	22,965.14	5.82×10 <sup>8</sup>

The distribution of rainfall in the Ziquejie Terraces is uneven, with less rainfall in late summer and early autumn. In drought years, crop failure would often occur in lots of rice fields down the hills, while paddy fields in the Ziquejie Terraces suffer little from the droughts. Without ponds or water reservoirs, adequate water resources in the Ziquejie Terraces can be attributed to the huge invisible water reservoir formed by forests, soils and terraces automatically. By estimated, the water storage capacity of the soil in this region is about 0.3 m<sup>3</sup>. Calculated by 40 cm of the topsoil depth, the water conservation function in Ziquejie Terraces is up to 3.3×10<sup>7</sup> m<sup>3</sup>.

Lianhe Terraces have an annual mean rainfall of about 1,600 mm, the raining days of approximate 220 days, the longest continuous raining days of 17-19 days, the longest continuous non-raining days of 16-20 days, and the annual mean evaporation of 1,313.4 mm. It is estimated that the water conservation amount of terraced ecosystem in the proposed site was 13.83×10<sup>8</sup> m<sup>3</sup> in 2015 (Table 1-2-4) and effectively guaranteeing the regular production of local terrace agriculture.

**Table 1-2-4 Water conservation amount in Lianhe Terraces in 2015**

Ecosystem	Area (×10 <sup>3</sup> ha)	Water conservation amount (×10 <sup>8</sup> m <sup>3</sup> /yr)
Farmland	1.86	2.73
Garden	0.47	0.69
Forest	7.08	1.04
Total	9.41	13.83

## (2) Soil Retention

Soil retention is also an important ecosystem function of these terraces. Covered by dense forests, terraces are rich in a variety of plants. Soil fixation character of vegetation roots is realized by the organic matter secreted by plants, which can therefore cement the soil and make them strong enough to resist the soil erosion. The canopy of tall trees intercept rain drops to undermine the erosion force of rain splash directly on the soil, while the regulation of the ground vegetation and the litter layer on precipitation and runoff basically eliminate the erosion forces of rainfall from the top and runoff on the surface of the soil. Therefore, terraces can help achieve better soil conservation, which is reflected in avoiding the waste of land, reducing sediment deposition and preventing the loss of soil nutrients.

As calculated in Chongyi Hakka Terraces, paddy fields can maintain the soil to 1.73×10<sup>5</sup> tons per year, forest vegetation conserves the soil to an amount of 9.09×10<sup>6</sup> tons per year. In addition, dryland, garden and grassland also have good soil conservation performances, which is, on average about 1.12×10<sup>4</sup> tons per year. On the whole, the total amount of soil conservation reaches 9.28×10<sup>6</sup> tons in a year (Table 1-2-5).

**Table 1-2-5 Soil conservation amounts of different landuse type in Chongyi Hakka Terraces**

Landuse type	Area (ha)	Soil conservation amount (tons/yr)
Paddy field	4,440.17	1.73×10 <sup>5</sup>

Dryland	254.04	$0.52 \times 10^4$
Grassland	443.62	$0.74 \times 10^4$
Garden	229.17	$0.38 \times 10^4$
Forest	45,541.12	$9.09 \times 10^6$
Total	50,908.12	$9.28 \times 10^6$

Longji Terraces is located at the mid-tropical monsoon climate zone with abundant rainfall amount under the influence of typhoon rainstorm. Mountain torrent is the most major disaster, which causes terraces collapse easily and brings hills serious soil erosion. However, the vegetation on the both sides of Longji Terraces is well protected, and there are different types of forest vegetation in the stereoscopic climate formed by the change of mountain shape and elevation, including trees, shrubs, grasses, etc. which are evergreen all year round and very benefit for soil and water conservation. On one hand, it has formed an ecological equilibrium system integrated into terraces area and forest area which is significant to soil and water conservation and soil improvement; on the other hand, layers of ridges have good control of soil and water in the terraces; meanwhile, the customs such as repairing broken terraces timely, no farmland construction, etc. have doing a lot of good conservation for soil and water. The data in Table 1-2-6 shows that forest and arable land are so important for the soil conservation. These lands bring the conservation up to  $3.65 \times 10^6$  tons for soil, which reflects the impart function of forest and arable land for the soil conservation (Table 1-2-6).

**Table 1-2-6 Soil conservation amounts of different landuse type in Longji Terraces**

Ecosystem	Area (ha)	Soil conservation amount (tons/yr)
Paddy field	1,360	$5.3 \times 10^4$
Dry land	2,942.37	$6.02 \times 10^4$
Garden land	166.39	$2.76 \times 10^3$
Forest	16,068.52	$3.21 \times 10^6$
Grass land	2,427.86	$4.01 \times 10^4$
Total	22,965.14	$3.65 \times 10^6$

The Ziquejie Terraces has important soil conservation function. As calculated on the basis of land use type, paddy field, dryland, grassland, garden and forest can conserve soil for  $2.37 \times 10^5$ ,  $3.01 \times 10^4$ ,  $0.53 \times 10^4$ ,  $4.22 \times 10^4$  and  $6.09 \times 10^6$  tons per year, respectively. In all, the total amount of soil retention in the core area was about  $6.40 \times 10^6$  tons in 2015 (Table 1-2-7).

**Table 1-2-7 Soil conservation amounts of different landuse type in Ziquejie Terraces**

Landuse type	Area (ha)	Soil conservation amount (tons/yr)
Paddy field	6093.25	$2.37 \times 10^5$
Dryland	1470.41	$3.01 \times 10^4$
Grassland	320.54	$0.53 \times 10^4$
Garden	2547.24	$4.22 \times 10^4$
Forest	30510.48	$6.09 \times 10^6$
Total	34848.67	$6.40 \times 10^6$

In Lianhe Terraces, the mountains cover 92% of its territorial area. Local people created a three-dimensional landscape using the mountainous landform, i.e. the landscape structure of forest-bamboo forest-village-terrace-river. The special landscape can play an important role in soil retention. It is estimated that the soil conservation amount of terraced ecosystem in Lianhe Terraces is  $118.91 \times 10^4$  tons in 2015 (Table 1-2-8).

**Table 1-2-8 Soil conservation amount in Lianhe Terraces in 2015**

Ecosystem	Area ( $\times 10^3$ ha)	Soil retention amount ( $\times 10^4$ ton)
Farmland	1.86	7.12
Garden	0.47	0.79
Forest	7.08	110.99
Total	9.41	118.91

### (3) Climate Regulation

These terraces have also played an important role in the regulation of temperature and air humidity. As mentioned before, these terraces are able to conserve water in a powerful way, so when the water evaporates into the air, it can reduce the temperature and increase the relative humidity in the surrounding air. Green vegetation can also lower the heat in summer through the canopy shade and regulate transpiration.

The forest ecological system of Longji Terraces has different types, including trees, shrubs, grasses, fern and moss, which has formed a variety of micro-climates as the forests at different altitudes to influence the surrounding environment. As mountain streams are the main part in the areas of Longji Terraces, where there are more developed water system and strong originality of evergreen broad-leaved forests and evergreen and deciduous broad-leaved mixed forests. It has high forest coverage and produces a variety of vegetation communities with intense radiation cooling at night which is favorable to formation of coagulum including fog, dew and rime and increases overall humidity and horizontal precipitation.

According to the local relevant documents, Longji traditional agricultural system has the annual average temperature of  $17.1^\circ\text{C}$ , with the average temperature of  $25.4^\circ\text{C}$  in the hottest month (July) and  $7.1^\circ\text{C}$  in the coldest month (January), the 1,223.3 hours of sunshine and 314 frost free days annually, 1,546.7 millimeters of rainfall, relative humidity of 82% and 314 frost-free days. With the features of mild spring and autumn, cool summer and warm winter, small fluctuation of temperature, abundant rainfall, equal relative humidity at four seasons and comfortable climate, it reflects that Longji Terraces play an important role in the formation of good climate and environment, which is not only suitable for the growth of animals and plants, but also more benefit to human health.

For example, Ziquejie Terraces System has high vegetation coverage that can help to achieve significant climate regulation effects. It enjoys the cool climate with an average temperature of  $13.7^\circ\text{C}$ , which is  $3^\circ\text{C}$  lower than that of the capital city of Xinhua County.

### (4) Gas regulation

Trees, shrubs and grass in the forest and varieties of crops in the farmland can all help to stabilize

CO<sub>2</sub> in the atmosphere through photosynthesis while releasing O<sub>2</sub> at the same time. Besides, soil microbes consume O<sub>2</sub> in the atmosphere by respiration and release CO<sub>2</sub> simultaneously, which help maintain the balance of CO<sub>2</sub>/O<sub>2</sub> in the atmosphere. Therefore, these terraces have a strong function of fixing carbon, releasing oxygen and increasing the content of aero-anion, playing a vital role in reducing greenhouse gas concentrations and mitigating the global warming.

There are about 5,367 ha of paddy fields, dry land, grassland and garden in Chongyi Hakka Terraces, besides 45541.12 ha of forest, with annual production of dry matter amounting to 2.28×10<sup>5</sup> tons. According to the photosynthesis equation, forest annual carbon sequestration is 1.03×10<sup>6</sup> tons and 7.59×10<sup>5</sup> tons of oxygen is released by forest every year; 7.44×10<sup>5</sup> tons of carbon is fixed and 5.49×10<sup>5</sup> tons of oxygen is released by paddy fields, dry land, grassland and garden every year. In brief, Chongyi Hakka Terraces has the gas regulation function of fixing 1.77×10<sup>6</sup> tons of carbon and releasing 1.31×10<sup>6</sup> tons of oxygen every year (Table 1-2-9).

**Table 1-2-9 Gas regulation amounts of different landuse type in Chongyi Hakka Terraces**

Landuse type	Area (ha)	Carbon sequestration amount (tons)	Oxygen released amount (10 <sup>4</sup> tons/yr)
Paddy field	4,440.17	3.08×10 <sup>5</sup>	2.27×10 <sup>5</sup>
Dryland	254.04	1.76×10 <sup>4</sup>	1.30×10 <sup>4</sup>
Grassland	443.62	3.07×10 <sup>4</sup>	2.26×10 <sup>4</sup>
Gardenland	229.17	1.59×10 <sup>4</sup>	1.17×10 <sup>4</sup>
Forest	45,541.12	1.03×10 <sup>6</sup>	7.59×10 <sup>5</sup>
Total	50,908.12	1.77×10 <sup>6</sup>	1.31×10 <sup>6</sup>

Ecological function of Longji Terraces also takes effect on adjusting local air emissions, which absorbs carbon dioxide mainly by the nitrogen fixation of forest and arable land and releases oxygen required for human breathing. According to the data of Longji Terraces in 2015, the carbon dioxide absorption of local land is 762,600 tons and the oxygen release is 639,700 tons (Table 1-2-10).

**Table 1-2-10 The amount of fixed carbon and released oxygen in the farmland and forest ecosystems in Longji Terraces in 2015**

Ecosystem	Area (ha)	Amount of fixed carbon (ton)	Amount of released oxygen (10 <sup>4</sup> ton/yr)
Paddy field	1360	39,100	28,800
Dry land	2942.37	204,000	151,000
Garden land	166.39	11,500	84,900
Forest	16068.52	340,000	251,000
Grass land	2427.86	168,000	124,000
Total	22965.14	762,600	639,700

As estimated by using the official statistical data in 2015, the forest land in Ziquejie Terraces can fix Carbon for about 689,129 tons and releasing oxygen for 507,329 tons annually. The annual fixed carbon of farmland was about 97,942 tons, meanwhile 72,104 tons of oxygen was released. Therefore, total amount of annual carbon sequestration in Ziquejie Terraces was 787,000 tons, and the amount of released oxygen was up to 579,000 tons.

Taking Lianhe Terraces as the study area, it is estimated that the amount of carbon fixed by the farmland sub-ecosystem and the forest sub-ecosystem are 53,513.3 tons and 150,092.9 tons in 2015

respectively, and the amount of oxygen released by the two sub-ecosystems are 39,396.3 tons and 11,0497.9 tons respectively. In sum, the total amount of carbon fixed by the terraces ecosystem in the core area is 161,920.6 tons in a year and the total amount of oxygen released is 149,894.2 tons in a year (Table 1-2-11).

**Table 1-2-11 Fixed carbon amount and released oxygen amount of the farmland and forest ecosystems in Lianhe Terraces in 2015**

Ecosystem	Area (ha)	Amount of fixed carbon (ton)	Amount of released oxygen (ton)
Farmland	1,680.4	53,513.3	39,396.3
Forest	7,083.2	150,092.9	110,497.9
Total		203,606.2	149,894.2

## (5) Air Purification

Green plants can directly absorb atmospheric pollutants through their leaf tissues, such as SO<sub>2</sub>, fluorides, NO<sub>2</sub>, Cl<sub>2</sub>, O<sub>3</sub>, etc. They can also dissolve part of the water soluble contaminants by the wet leaf surface. Therefore, forest and paddies in these terraces have played a very important role in improving local air quality, including SO<sub>2</sub>, NO<sub>x</sub>, HF adsorption and dust retention.

Integrated computing results show that Hakka Terraces can adsorb about 10,060 tons of SO<sub>2</sub>, 451.94 tons of NO<sub>x</sub>, 166.08 tons of HF every year, and the amount of dust retention is about 1.15×10<sup>6</sup> tons per year (Table 1-2-12).

**Table 1-2-12 Environmental purification amounts of different landuse type in Chongyi Hakka Terraces**

Landuse Type	Area (ha)	Adsorption SO <sub>2</sub> (tons/yr)	Adsorption NO <sub>x</sub> (tons/yr)	Adsorption HF (tons/yr)	Dust retention (tons/yr)
Paddy field	4,440.17	199.80	147.85	2.53	1.47×10 <sup>5</sup>
Dryland	254.04	11.43	8.45	0.14	0.84×10 <sup>4</sup>
Grassland	443.62	19.96	14.77	0.25	0.96×10 <sup>4</sup>
Gardenland	229.17	10.31	7.63	0.13	0.49×10 <sup>4</sup>
Forest	45,541.12	9818.66	273.24	163.03	9.86×10 <sup>5</sup>
Total	50,908.12	10060.16	451.94	166.08	1.15×10 <sup>6</sup>

By monitoring the air quality of the ridge and other areas for 5 days, it can be found that there are few pollutants such as SO<sub>2</sub>, NO<sub>x</sub> and TSP in the air in Longji Terraces. The average value of PM<sub>2.5</sub> is 3.5 ug per cubic meter, and the atmospheric environmental quality meets the national standard. The air monitoring data show that the average concentration of negative ions in the air is 4920 per cubic centimeter, the degree of fresh air is up to a very fresh level, and the overall condition of the air is good for health.

The monitoring data of air quality in the capital city of Xinhua County showed that the average content of SO<sub>2</sub>, NO<sub>2</sub>, TSP in 2013 was 0.076 mg/Nm<sup>3</sup>, 0.033 mg/Nm<sup>3</sup>, and 0.089 mg/Nm<sup>3</sup>, respectively. The data obtained near Ziquejie Terraces showed that the average content of SO<sub>2</sub>, NO<sub>2</sub>, TSP, PM10 was 0.029 mg/Nm<sup>3</sup>, 0.017 mg/Nm<sup>3</sup>, 0.054 mg/Nm<sup>3</sup>, 0.036 mg/Nm<sup>3</sup>, respectively, in the same year. Since the standard values of SO<sub>2</sub>, NO<sub>2</sub> and TSP contents in atmosphere are 0.15 mg/Nm<sup>3</sup>, 0.10 mg/Nm<sup>3</sup>

and 0.15 mg/Nm<sup>3</sup>, respectively, the air quality in Ziquejie Terraces is obviously superior to that in the capital area of Xinhua County and the average content of SO<sub>2</sub>, NO<sub>2</sub> and TSP is far below the standard value.

In Lianhe Terraces, farmlands and forests are two main sub-ecosystems of purifying air. It is estimated that the two sub-ecosystems can absorb 1610.8 tons of SO<sub>2</sub>, 103.9 tons of NO<sub>x</sub> and 26.4 tons of FH in 2015, and reduce 155.2 tons of dust in the air in 2015 (Table 1-2-13). Overall, the forest sub-ecosystem has stronger air purification capacity than the farmland sub-ecosystem. This means that Lianhe Terraces have a higher air purification value than the rural area in plains due to its high forest concentration rate.

**Table 1-2-13 Air purification capacity of the farmland and forest ecosystems in Lianhe Terraces in 2015**

Ecosystem	Area (ha)	Adsorption amount (ton)			Dust retention amount (ton)
		SO <sub>2</sub>	NO <sub>x</sub>	FH	
Farmland	1,680.4	83.7	61.4	1.1	1.7
Forest	7,083.2	1527.2	42.5	25.3	153.4
Total		1610.8	103.9	26.4	155.2

## (6) Water Purification

Diverse cropping and breeding patterns in these terraces, like raising fish, ducks, escargots and loaches in paddy field, can decrease the application amount of chemical fertilizers and pesticides, therefore improving the health status of farmland ecosystem. On the one hand, the duck manure and fish feces contain rich nutrients like nitrogen and phosphorus. On the other hand, the activities of duck or fish in the paddy field can help loosen the soil, which will both greatly improve the permeability of paddy soil and reduce the hazards of toxic substances while accelerating the decomposition and absorption of fertilizer. Those activities are also beneficial for the respiration and development of rice roots, thus in turn contributing to the effective rice tillers. Meanwhile, biological magnification of weeds and plankton is weakened, thereby reducing the methane emissions in paddy fields.

## (7) Disease, pest, weed control

These terraces, on the one side, can decrease the incidence of diseases, pests and weeds in forest and farmland due to mutual inhibition effect of creature and isolation effect of landscape. Their diverse cropping and breeding patterns, on the other side, can prevent damage from insects in the farmland through the foraging and moving of animals. Ducks or fish raised in the paddy field can prey on pests of rice and some *sclerotia mycelium*, which can remove the diseased leaves, old leaves and the weeds. Therefore, these activities can effectively control and eliminate the rice sheath blight, *Chilo suppressalis*, rice leaf folder, rice plant hopper, rice grasshoppers, army worm and other pests of rice and paddy weeds.



## 1.3 Knowledge systems and adapted technologies

### 1.3.1 Traditional technologies for terraces construction and maintenance

#### (1) Construction

The construction of the four rice terraces shares a lot of commons. Most of them started with “slash and burn” to make original forest change into dryland. Then measures were taken to transform the dryland into tableland in accordance to local irrigation conditions and gradually turn them into cultivated lands. Stones and sticky soils were used to construct the tableland and terraced ridges were also constructed for retaining water. The third step is to transform the tableland into terraced fields gradually by building a complex ditch system for irrigation and drainage. Rice began to be planted along with the gradual improvement of the terraces and the development of water retention capacity. However, there are also many differences in the details of the construction processes that are further elaborated in the following text.

#### 1) Construction of Hakka Terraces

Chongyi Hakka Terraces come from She (“畚”) fields, which refer to the local tradition of slash and burn. The Hakkas cut down the trees in early spring, and then at the night before the rain comes, they burned all trees and use the ashes as fertilizer. They planted the next day and waited for the harvest without any management. She fields are considered a primitive way of mountain utilization, because the planting adapts to the downslope landform and the fields are not built with ridges. The problem is when the rain pours, the soil washes away causing severe erosion.

To solve the problem of soil and water loss, the Hakkas reconstructed the She fields. The soil in the high place was dug out and put into the low place and the excess mud was used to build the ridge of the field. At the initial formation stage, dryland crops, such as millet, beans, wheat and taros, were mainly planted. Rice began to be planted along with the gradual improvement of the terraces and the development of water retention capacity.

The Hakkas build the ridge of the field with mud. Conforming to the height of mountain, the ridge of the field varies in height. The highest ridge is more than 3 meters high. Because some terraces fields are high, and their water collecting is inconvenient, the Hakkas build some ponds on the top of the terraces and retain the original forest (Figure 1-3-1) to maintain water levels. The Hakkas use Zhen (“圳”) to name the ditch. Farmers dig the ditches connecting the water sources to the fields. Open diversion trough is used to replace the ditch, when the land is hard to dig. Open diversion trough is named Jian (“枧”or“笕”) which is made of bamboo or wood.



Figure 1-3-1 Top pond and hill forests in Hakka Terraces

## 2) Construction of Longji Terraces

Longji ancestors created the technique of steeping slope reclamation. Firstly, they reclaimed the mountain forest into grassland by slashing and burning farming methods. They selected compacted soil surface and dig up clay when reclaiming farmland, and filled firmly for each clay layer, and kept balance with the compaction of filling layer and non-filling layer. In case there are rocks, they burnt up the rock and splashed cold water on it and then the rock blew up. Ancestors also blew through the straight *phyllostachys pubescens* as a level gauge, and used the isosceles triangle vertical principle to level fields with the same height. There are ridges on the sides of the Terraces, built up by thick soil or stones, which are normally 20-30 cm higher than the terraces ridge (Figure 1-3-2). Diversion canal is built at the sides of ridges, and the canal flow has the division of main canal and branch canal. Mountain spring water and natural precipitation are restored or introduced to the canal, and the canal water flows to the terraces by the ridge gaps with the shape of “concave” or “concavo-concave-concave-.....”, and the number and size of the ridge gaps depend on the area of irrigated fields; after filling the fields, the canal water continues to flow down to the streams. In the non-irrigation season, the communicating parts between the terraces and canals are blocked. It uses the method of transporting water by bamboo for some of the water shortage terraces, which is to set up bamboos directly between the head water of the adjacent mountain and the terraces, and the water will flow to the terraces. The diversion irrigation system may be rated as a unique and gave a detailed report in the *Geography China* column of CCTV.

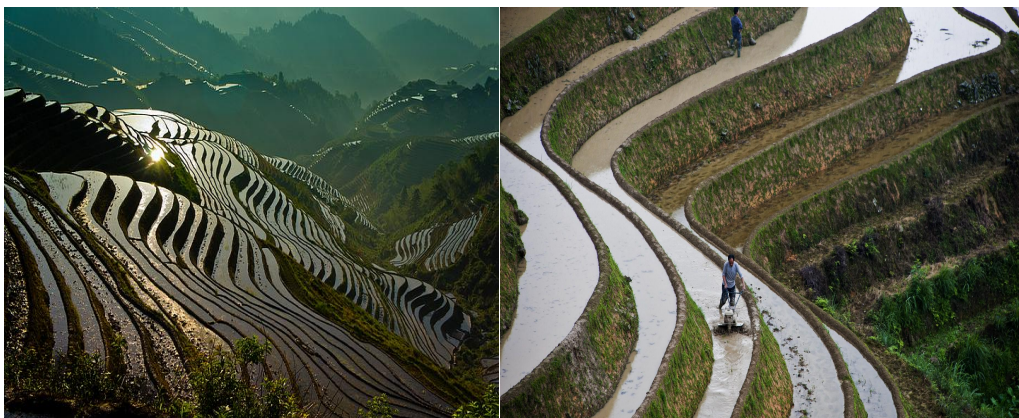


Figure 1-3-2 Terrace ridges in Longji Terraces

### 3) Construction of Ziquejie Terraces

The soil in the Ziquejie Terraces is sandy loam soil featured with light soil texture, which makes the construction of terraced fields to be very difficult. Therefore, gradual construction methods were adopted by local farmers in constructing terraced fields. Firstly, excavation of dryland was conducted in the gentle slopes. After a period of cultivation, dryland in the gentle slopes became flatter and flatter. Secondly, measures were taken to transform the dryland into tablelands in accordance to local irrigation conditions and gradually turn them into cultivated lands. The final step is to transform the tablelands into terraced rice fields gradually. Through the repeated digging, fertilization, cultivation and gradual ripening process of dryland - tableland - paddy field, the construction quality of the terraced fields is guaranteed; the fertility of the terraced fields is stabilized, while the impermeable and durable character of ridges is ensured. Because the sandy loam soil has good water permeability, it requires using curing clay plaster for multi-layer reinforcement when constructing the ridges. Generally, the ridge of the terraced fields in Ziquejie Terraces is about 50 cm high and 35-45cm wide.

In Ziquejie Terraces, on the one hand, local people make full use of the fissure water among granites and the pore water of soils. All these water resources formed lots of small natural irrigation systems. On the other hand, local people intercepted water resources in high mountain first, then excavated ditches and constructed diversion gate to irrigate the terraced fields level by level. A set of effective measures to ensure the scientific water management was formed at the same time. Eventually, the complete natural irrigation system was come into being (Figure 1-3-3).



Figure 1-3-3 Ziquejie Terraces

### 4) Construction of Lianhe Terraces

The construction technology and process of the Lianhe terraced fields is similar to that of Hakka Terraces in Chongyi County due to similar natural environmental characteristics. For example, the traditional “slash and burn” was also used by people in Lianhe Terraces for dry farming before digging terraces; then slope lands were transformed into impermeable tablelands through digging tools such as spade and pickaxe; building terraces aimed at soil retention for increasing food yield per unit.

Construction of Lianhe Terraces usually starts from the middle of mountains with gentle slope and deep soil layer. Lianhe Terraces are constructed top-down. There are three steps in building terraces based on tablelands: the first step is to construct the tableland using stones and sticky soils; the second step is to construct terraced ridges for retaining water; the third step is to build a complex ditch system



for irrigation and drainage for the terraces. The ditch system consists of trunk ditches and branch ditches and overflow weirs dug on terraced ridges. Trunk ditches are dug based on the natural ditches close to terraced fields; branch ditches usually are built manually, which link terraced fields to trunk ditches (Figure 1-3-4). These ditches were soil texture before, but now part of them has been hardened using concrete. Besides, overflowing weir was dug on the ridge each field, which connects all fields each other for water running step-by-step down, and it is a common irrigation method.

Construction of terraces is very difficult and slow. Building one layer of terraces needs two years according to ancient books. Lianhe Terraces distribute between 300 m and 900 m, with 600 m of the maximum relative height difference. Therefore, these magnificent terraces built had spent a very long time.



Trunk ditches

Branch ditches

**Figure 1-3-4 The ditch system in Lianhe Terraces**

## **(2) Maintenance**

Traditional knowledge and adapted technologies are widely used in the maintenance of the four rice terraces. Farmers usually plow and plough the terraced fields in autumn and winter, and they also plough and level the terraced fields before planting rice in spring. In some terraces like Ziquejie Terraces, the terraced fields are soaked in water during the winter to prevent the terraces from collapse and also play the role of water storage and water conservation. In some terraces like Hakka and Lianhe Terraces, the ridges of the terraces fields are planted with beans to protect the ridge through the roots of the beans and to fix nitrogen and alleviate the nutrient limit in these areas.

### **1) Maintenance of Hakka Terraces**

Without regular maintenance time, the ridge of the field must be repaired once it is collapsed. Hakka farmers usually use mud to repair the ridge, but sometimes they also use branches of trees to enclose it. The crops need more water in the season of ploughing. Previously, farmers stored water in most fields to protect the ridge from collapsing in winter, but nowadays few of them do this.

The Hakkas have the habit of planting soybean on the ridge edge of paddy fields, which is commonly known as "Tiangeng beans" (Figure 1-3-5). They start the seedling cultivation at the end of April each year, and after rice planting they dig holes (about 13 cm long, 7 cm wide and 6 cm deep) at intervals of 15 to 20 cm, put the farmyard manure into the corner. The bean seedlings are vertically



planted into the corner of the hole without fertilizer; every hole is planted with 2-3 strains. The beans are harvested from late September to early October, earlier than the harvest time of rice.



Figure 1-3-5 Planting soybeans on paddy field ridge edges in Chongyi Hakka Terraces

## 2) Maintenance of Longji Terraces

The maintenance for terrace of local villagers is mainly based on a water and fertilizer cycle management system with the functions of site-specific recommendation and self-regulation. The local people divides the mountain into three sections while using the land resources: the mountaintop is virgin forest, which is good for water conservation and provides necessary sources of meat and vegetable for the animals and plants in the forest; villages are built on the mountainside with a good climate; reclaiming terraces at the foot of mountain is not only convenient for drinking and irrigation water, but also easy to transport the human and animal feces of the villages to the fields. In addition, local villagers will reclaim bunds and repair the ridges at regular time every year. Reclaiming bund is to ensure the terraces firmness and prevent the field water from seeping. The time of reclaiming bund each year is before the planting period, the method is to pull out the weeds on the ridges and use the bamboo bund knife to level the bunds until soil can be seen on the ridges. The date of repairing ridge is before the period of spring ploughing between March and April each year and about once or twice a year, and the method is to cover with mud to reinforce ridges by hand and reinforce bund by feet. In order to prevent the terraces from cracking, irrigation must be stopped in winter (Figure 1-3-6).



Figure 1-3-6 Irrigation must be stopped in winter and maintain the ridges in Longji Terraces

### 3) Maintenance of Ziquejie Terraces

The traditional technologies of the maintenance of terraced fields, which are mainly used in Ziquejie Terraces, include soaking the fields in water during winter and repeated ridge repair in spring. After the harvest of mature rice in fall every year, the paddy fields are irrigated and soaked in water till the spring of the coming year. The water being reserved in the fields is about 10-20 cm in depth, and local farmers use different ways to find and fix holes in the ridges. This will not only prevent the terraces from collapse, but also play the role of water storage and water conservation. To prevent eel and mud fish from drilling holes that might result in leakage caused by the penetration in the ridges, local farmers always light up at nights for observation.

Local farmers generally plow and plough the terraced fields in autumn and winter, and they also plough and level the terraced fields for 2-3 more times before planting rice in spring (Figure 1-3-7). To ensure the stability of the terraces, there is an important part of the soil preparation process called “paste ridges”, i.e. to clean up and repair the ridges (Figure 1-3-8). Usually when the terraced fields are ploughed for the first time, weeds on the ridges will be removed and thrown into the fields to be buried with soil to ensure rotting. When the terraced fields are ploughed for the second time and irrigated, ooze is used to increase the thickness of the ridge by about 10 cm. The pasted ridges are left for dry in the sun for about three days before ooze is used to level up the sides of the ridges for the second time with the main purpose to increase the thickness of the ridges and ensure its leakage-proof, water retention and prevent the collapse of the terraced fields.



Figure 1-3-7 Farm Cattle Ploughing in Ziquejie Terraces



Figure 1-3-8 Maintaining Ridges of Ziquejie Terraces

### 4) Maintenance of Lianhe Terraces

In Lianhe Terraces, the ridges and walls of the terraces are reinforced through two approaches which are manual repair and planting strengthening. The ridges of terraces are usually repaired manually by the local farmers once in a year. In winter, Lianhe terraced fields are used to plant dry crops such as *astragalus sinicus*, white radish, and leaf mustard. Being dry for a half year, the soils of ridges become loosened and tend to leak. Thus these ridges and walls are repaired by local farmers during plowing and flattening the farmlands before the rice cultivation. The operating method is to dig soils out from fields and put them on ridges and tread repeatedly so that these soils become tight. Planting beans on the ridges is another approach to strengthen the ridges and walls of the terraces.

According to survey, 90% of the ridges were planted with beans by the local farmers. The beans can protect the ridge well through their roots and also can fix nitrogen and alleviated the nutrient limit in subtropical rainy areas.

## **1.3.2 Traditional rice cultivation technologies**

### **(1) Seed selection**

When rice is harvested, farmers in these terraces choose the best grain as seeds for the next year. After being collected, the seeds are put under the sun to dry or tied with a rope hanging high in dry places in order to prevent them from getting damp. The selected seeds must go through three stages including drying, soaking and accelerating germination. Drying is used for making seeds to absorb the sunshine, using ultraviolet radiation to sterilize and kill off the insect pests, removing carbon dioxide and moisture, enhancing permeability, water absorbent and enzyme activation, thus improving the germination rate and germination energy and achieving the uniformity of emergence. Soaking the seeds in cold water for 3-5 days enables them to absorb enough moisture to be ready for the next step of germination.

The final step is accelerating germination and then sowing the seeds when they germinates. High quality seeds are the foundation for raising rice seedlings, while accelerating germination is the key to the success. Since ancient times, local farmers have mainly used large bamboo baskets or squared barrels for accelerating germination. This method is relatively simple and easy to master. In the process of accelerating germination, local farmers wash up the squared barrels first, then open the cork on the one end with hole and slightly elevate the other nonporous end a little for water draining. After that, the well soaked rice seeds are washed clean, drained and poured into the squared barrels till 60 percent space of the squared barrels is filled up. Straws are used to cover the seeds with heavy bricks or rocks on their top to ensure insulation. According to the experience of local farmers, temperature should be high in the period before the germination of the radicle (commonly known as chest burst) of rice seeds to accelerate the germination, which is also considered as a key step to prevent or reduce the failure of germination. The best temperature for germination at this stage is about 40 °C . After germination, the temperature shall be lowered to about 30-35 °C , while attention shall be paid to the moisture regulation and good oxygen supply maintenance. When roots of most rice seeds broke out of the chest, local farmers conduct a thorough turn over and add more fresh water while maintaining the temperature between 30-35 °C . After one night, they conduct thorough turn over for the second time. At this point, the germination of rice seeds is basically completed. The length of the roots to be germinated is determined by the weather. The rice sprout shall be longer in good weather for the faster emergence of seedlings. When the weather is bad, the rice sprout shall be shorter to enhance their cold tolerance capacity. When the sprouts are of 0.33-0.66 cm in length and the roots are about 1.32-1.65 cm in length, seedlings are ready for plantation in good weather. Southward fields with sufficient sunlight are usually selected as rice seedling beds. The soil texture is required to be loosen and fertile. The fields are required to be fallow fields in the winter with smooth surface, even fertility, adequate water resource and convenient drainage and irrigation.

## (2) Seedling cultivation

Farmers in these terraces usually begin sowing on the Waking of Insects around the first day of lunar February. They mainly use the direct seeding methods, and a few choose the method of shovel seedling. The direct seeding method is to sow the buds to the field directly, cultivate seedlings in the field and fill the gaps from dense to sparse only among individual plants. This method saves both time and labor.

## (3) Ploughing

When it comes to soil preparation, farmers in these terraces usually adopt the principle of intensive and meticulous cultivation. They plow the soil depth of 15-18 cm with a rotary tiller plow and harrow twice or even three times to ensure the height of the ridge to be approximately 35 cm so that the water with fertilizers does not overflow. Then, they shovel all the tender grass, pick up the weeds in the field as soil fertilizer, and prepare the soil with cattle and other tools, such as the plow and rake (Figure 1-3-9).



Figure 1-3-9 Ploughing with cattle in Chongyi Hakka Terraces

In Longji Terraces, the local farmers also plough manually in pairs (Figure 1-3-10). The geographical characteristic of Longji Terraces is not suitable for extensive use of machinery or cattle cultivation. Therefore, the local people adopt the ancient pair ploughing method to farm. Manual ploughing in pairs in Longji Terraces is the farming method with the feature of two-people cooperation, which includes father-son, brothers, couples and other pair ploughing styles. The ploughing style of “female pulling at the front, male pushing at the back” is still in use today, which is the former uses one hand to grid the safety bar close to the cheeks and another hand to hold the rope tied on the plough bar behind; the latter uses one hand to hold the plough handle and another hand to hold the plow bow and puts his shoulder to push the plough bar. This ploughing method has been in operation for 800 years.



Figure 1-3-10 Manual ploughing in pairs in Longji Terraces



## (4) Transplanting

Due to the small area of patches and low accessibility of terraces, transplanting seedlings is mainly done by manpower (Figure 1-3-11). The depth of planting is about 2 cm, and each point is planted with 3-4 basic seedlings. During transplanting, seedlings must stand up straight and be divided evenly, with the density of about 90,000 unit/ha.



Figure 1-3-11 Transplanting seedlings in Chongyi Hakka Terraces

## (5) Irrigation

Shallow water irrigation and intermittent irrigation. In the early stage of rice transplantation, rice root is weak in the absorption of water and fertilizer. Meanwhile, due to the outside high temperature and strong winds, the rice leaf transpiration is relatively intensive. Therefore, farmers choose to make the water in the field shallow to prevent death of the seedlings. This is called shallow water irrigation. Generally, the depth of the water is 1/2-2/3 of the height of the rice, not to drown the rice center. Farmers choose another irrigation approach, which is called intermittent irrigation, when the rice begins to turn green. The depth of the irrigation water is maintained between 3 and 5 centimeters in this period, until the root of the rice do not need water or the soil needs to dry. Farmers usually drain and dry the field from the stage of rice tilling to the stage of young ear differentiation. In the daytime, water reduces the temperature in the field and affects the growth of the rice. Therefore, farmers need to irrigate the field in one or two hours before the sunset and one or two hours after the sunrise. Farmers also need to check and reinforce the ridge to prevent the leakage of the water.

## (6) Fertilizing

The main fertilizers in these terraces are farmyard manure (both human and animal manure), plant ash, defatted cake, stalk ash and lime (Figure 1-3-12) as well as green manure (such as green radish, beans and milk vetch). In addition, after the harvest in autumn, cattle, ducks, chickens and other livestock are scatter-fed in the fields of some terraces (Figure 1-3-13, Figure 1-3-14), which can forage for grains and glean seeds and insects in scattered fields. Retrieved rice straw usually does not need to be uprooted, but is left in the field to ferment together with feces of livestock in winter, which can improve soil fertility.



Figure 1-3-12 Retting farmyard manure



Figure 1-3-13 Field gleaning in winter



Milk vetch



*Azolla*

Figure 1-3-14 Green manure

## (7) Disease, pest and weed control

Local traditional methods in the prevention and control of diseases, insect pests and weeds are mainly through ploughing in winter, burning the weeds and stubble at the edge of the fields (Figure 1-3-15), catching insects with hands, avoiding the high incidence of pests, firing at night, pouring tobacco stem water (kind of indigenous pesticides), scattering lime and plant ash, sprinkling rotenone and oil-tea camellia defatted cake. Replanting or rotation is adopted where pest damage is serious. In addition, farmers reduce pest damage through free-range chickens, ducks and geese in the fields and raise ducks or fish in the fields.



Figure 1-3-15 Burning stubble and ploughing in winter

## (8) Harvesting

During the harvest season, rice is cut down to dry in sunny weather for 1-2 days (Figure 1-3-16). Then farmers in Ziquejie Terraces stand around the squared barrels with rice plants in their hands to thresh the rice grain into the squared barrels. Farmers in Hakka Terraces thresh in the threshing bucket (Tong Gang). Since 1960s, the Hakkas have trampled the threshing with their feet to take off the grain, cutting while threshing.



Figure 1-3-16 Rice Harvest in Chongyi Hakka Terraces

### 1.3.3 Compound agro-ecosystems

#### (1) Rice-Fish system

Rice-fish model is commonly practiced by local farmers in these terraces except Longji Terraces (Figure 1-3-17). Local farmers usually select paddy fields with low altitude, adequate water resource, convenient irrigation and drainage, good water quality, good water retention conditions and sufficient sunlight. Ridges of selected paddy fields are usually heightened and reinforced to prevent water leakage, since ridge collapse and floods over the ridge that might cause the loss of fish in the paddy fields. Small ponds digged in the paddy fields are usually called fish pits, which usually consist about 5% to 10% of the total area of the paddy fields. Digging fish pits are considered as the key step in fish-farming in local areas, followed by fish ditch excavation, usually in the shape of “Cross” or “#”. Various shapes can be adopted in fish ditch with the prerequisite of ensuring smooth movement of fish to the larger areas of paddy fields. Meanwhile, bamboo fences are set up at both the water inlet and outlet of the paddy fields to prevent the escape of adult fish. The size of fish ditch usually is 60cm in width and 50cm in depth. , The ditching is normally conducted 20 to 30 days before rice planting.



Figure 1-3-17 Rice-Fish system

Between the Spring Equinox in March and Tomb Sweeping Day in April, it is the time for the first plowing, maturing basic fertilizer (organic fertilizer) and repairing the ridge. In late April, it is time for the second plowing, harrowing, and repairing the ridges with mud. From late May to early June, when transplanted rice resumes growth and begins tilling, small fish fry are put into the fish pits and they begin to slip through the pond into the paddy fields to conduct foraging activities. From late June to late August, the rice enters into the heading, flowering, and milk ripeness stage. During this lush growth period of rice, fish is fed on insects in the field (leaf borer, rice planthopper, etc.) and continue to grow. In early September, grown fish can be harvested, sold and consumed, while small fish are left to continue to grow. From October to March in the following year, the paddy fields are flooded and enter the fallow period, when fish are left in the pond for overwintering. The rice-fish model is shown as in Table 1-3-1.



**Table 1-3-1 Annual Circle of Rice-fish Model**

Month	1	2	3	4	5	6	7	8	9	10	11	12
<b>Rice growing season</b>	Fallow period				Period of resuming growth and tillering				Harvest season	Fallow season		
<b>Growing season for fish in paddy fields</b>	Overwintering period for small fish				Fish fry are put into the paddy fields	Growing season for small fish				Adult fish		

## (2) Rice-Duck system

Rice-duck model is also commonly practiced by local farmers in these terraces (Figure 1-3-18). Local farmers usually select paddy fields with adequate water resource and plenty of sunlight to provide appropriate habitats and food source for ducks. They select the high-quality rice varieties with compact plant type, high yield, and strong resistance. They also select fine duck species with relatively small or medium body size to ensure their adaptation to the rice planting density, which enables the ducks freely travel in the paddy fields for food and other activities. In terms of timing, in late May when the transplanted rice resumes growth and enters peak tillering period, ducklings are put into the rice fields for free-range farming. During the day, ducklings foraging in the field prey on larvae and weeds and at night they return to duck sheds on their own (local houses are generally the wooden structure and the bottom layer usually taken for keeping poultry). Corn and other grains are added to the fodder for the ducks to fatten up and gain weight. By the end of September, after the rice is harvested, mature ducks remain in the field to pick up scattered rice and prey on field pests. When the Double Ninth Festival arrives, mature ducks can be used for food or sold out. October to next April, a proportion of female duck are kept and fed for egg laying, or re-breeding. Rice-duck model is shown as in Table 1-3-2.



**Figure 1-3-18 Rice-Duck system**

**Table 1-3-2 Annual Circle of Rice-duck Model**

Month	1	2	3	4	5	6	7	8	9	10	11	12
<b>Rice growing season</b>	Fallow period				Period of resuming growth and tillering				Rice harvest season	Fallow period		
<b>Duck growing season</b>	re-breeding period for female duck				Ducklings are put into the paddy fields	Growing season for ducklings				Mature ducks		



### 1.3.4 Intercropping

Farmers in these terraces adopt the intercropping of multiple varieties (Figure 1-3-19). Intercropping can take advantage of different biological characteristics of different crop varieties, different resource utilization patterns and stress resistance characteristics. The intercropping of multiple varieties like rice-bean intercropping has not only guaranteed stable crop yield, but also improved the stress resistance of terrace system, therefore greatly reducing the use of pesticide and improving the quality of agricultural products (Figure 1-3-20).



Figure 1-3-19 Multiple varieties intercropping in Lianhe Terraces



Figure 1-3-20 Multiple varieties intercropping in Ziquejie Terraces

### 1.3.5 Crop rotation systems

Crop rotation is common for both rice paddies and dry land in Lianhe Terraces (Figure 1-3-21) and partly exists in Hakka Terraces, Longji Terraces and Ziquejie Terraces. In paddy field, crop rotation types include rice (soybean)-milk vetch, rice-oilseed rape, rice-pea (broad bean), rice-corn, rice-vegetable (tomato, celery, cucumber, spinach, potato, melon, Chinese cabbage, cabbage, sweet potato). In dry land, crop rotation types include sweet potato-vegetable, peanut-vegetable, corn-vegetable, mesona-vegetable and so on.

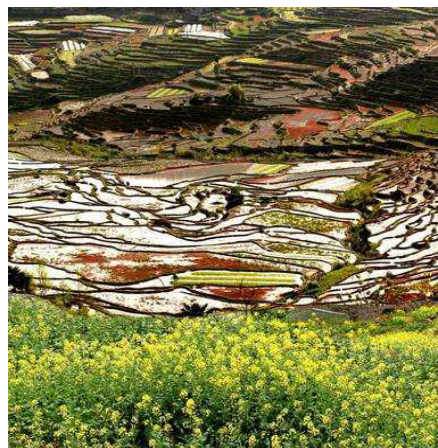
**Rice-tomato rotation.** After harvesting rice, the low temperature resistant, early-maturing, mature concentrated, high-quality variety of tomatoes is selected to be seedling-raised in early November and transplanted in the next mid-February. Generally, they appear on the market in late April and their harvest ends in early June. Rice is seedling-raised on May 1, transplanted in mid-June and harvested in early October.

**Rice-cross-winter celery rotation.** Celery is seedling-raised in late July. The rice selected is the

early-maturing variety, such as Taiwan white rice etc.. Soil preparation shall be carried out in time after harvest in late September, and then celery is transplanted into arched greenhouses. The planting spacing is generally 11 cm × 11 cm, averagely 750,000 per hectare. After late October, grass carpets are successively added, celeries are picked in winter and spring, and harvest ends in mid April.

**Rice-cucumber-spring rape rotation.** After the harvest of rice, cucumbers are seedling-raised in mid-October and transplanted into arched greenhouses when each of them has four leaves and one stalk, and before and after spring, they appear on the market in batches. Uprooting spring rapes after their edible portions have been harvested in the next early May, then the soil is prepared and spring rapes are sowed for harvest in early June.

**Rice-rape rotation.** In March to April every year, local villagers raise rice seedlings in the seedbed. In early May, they transplant seedlings into the paddy fields, harvest in November. Planted rice varieties are Tonghe Rice, Glutinous Sticky Rice, Red Sticky Rice, Black Sticky Rice, Green Sticky Rice, etc. These are the special breed selected by local people generation after generation and the unique rice produced in Longji. To add terraced fields in winter and spring, enhance the quality of tourism, also to increase the economic output, the local villagers here cultivate rape every winter. Rape area in winter is about 300 acres, accounting for about 20% of the total area of the terraced fields; the remaining 80% of the terraced fields are barren land for grass to maintain the land fertile.



**Figure 1-3-21 Rice-cucumber-spring rape rotation in Lianhe Terraces**

**Rice-spinach-potato rotation.** After the harvest of rice, spinaches are sowed in early and mid-October, and appear on the market in batches from the New Year's Day to around the Spring Festival. Ridges are formed and potatoes are sowed in later February and early March, and then film-mulched. 1500 kg of seeds are used per hectare, the ridges formed are 75 cm wide, the planting spacing is 30-35 cm × 20 cm, and the harvest starts in late May and early June.

**Rice-potato rotation.** There are mainly two modes for rice-potato rotation, early rice-autumn sweet potato and spring sweet potato-late rice. The early rice planted is the early, mid-maturing rice with the growth period of 115-125 d, which is sowed and seedling-raised at the end of mid-march, transplanted in mid- and late April, becomes mature and is able to be harvested in middle and late July; the soil preparation and planting of autumn sweet potatoes is from late Jul to early August, and their harvest is in early and middle December; for the greenhouse seedling cultivation of spring sweet potatoes, the soil preparation and planting is from late March to early April, and their harvest is in late July; and the late rice planted is the early, mid-maturing rice with the growth period of 110-120 d, which is sowed in mid-July, transplanted in early August, becomes mature and able to be harvested in early November.

**Rice-melon rotation.** Watermelon-rice rotation does not only effectively overcome the successive cropping obstacle of watermelon but also properly controls the occurrence of rice stripe disease. It is a cultivation mode easy to operate with low investment and high profits. The seedling cultivation of watermelon starts from mid-January, transplanting is in late February, the first batch of picking starts from mid-April and ends in mid-May, and the second batch of picking is in mid- and late June and then, the orchard is cleared; rice is sowed and seedling-raised on 1-5 of June, rotary tillage on fields starts in

late June, then transplanting is carried out by machine or hand, harvest after mature is in later October, and ploughing and curing is in November.

**Rice-grass rotation.** Mat grass is a kind of perennial root moor herbaceous plant, mainly including common rush, Chinese alpine rush, bulrush, etc. Rice-grass rotation is a bond of integration of farming with animal husbandry, which is beneficial for the construction of ternary structure of grain, economic plant and fodder in crop farming system.

### 1.3.6 Traditional farming tools

Rice farming tools are one of the most important indicators for rice farming skills and developmental level of rice agricultural production, and meanwhile rice farming tools continuously develop and evolve with constant improvement of rice farming skills and unceasing development of rice agricultural production. They are characterized in lightness, convenience, obtaining raw materials locally and suitability for multiple purposes.

#### (1) Ploughing tools

The traditional tools used for ploughing in these terraces include ploughs, harrows, rakes, hoes, etc. (Figure 1-3-22)



Curved-thill plough: a handy tool suitable for ploughing on terrace and flexible for operation, which can economize on manpower and animal power.



Harrow: used for breaking up and smoothing out the surface of the soil after ploughing and before rice transplanting.



Iron rake: mainly used to flat fields and make it easy to grow seedlings



Wood rake: mainly used to flat fields and make it easy to grow seedlings





Rotary plough stumping machine: a farming tool used for smoothing horse paddy and pressing grass.



Grass pressing machine: a farming tool using manpower to smooth paddy and press grass.



Hoe: a tool used to open up wasteland or dig or loosen the soil and do other works.



Spade for Sink: a tool used to shovel dirt



Wooden Harrow: a tool used to reclaim land

**Figure 1-3-22 Ploughing tools in the four rice terraces**

## (2) Weeding tools

The traditional weeding tools in these terraces include sickle, knife, pitchfork, shovel, etc. (Figure 1-3-23)



Qindao (a kind of sickle): a tool used to clear the weed on the walls and the ridges of terrace.



Pizai (a knife with two edges and a short wooden handle): also called “double edged Qindao”, used to clear the weed on the ridges and walls.



Pitchfork: a tool for weeding rice field



Iron shovel: a tool used to shovel grass

**Figure 1-3-23 Weeding tools in the four rice terraces**



### (3) Irrigation tools

The traditional irrigation tools in Longji and Lianhe terraces include elevated moso-bamboo water pipeline, water segregator vessel, special bamboo tube, woody amaranth, etc. (Figure 1-3-24)



Elevated moso-bamboo water pipeline: use for transporting water on the mountains to the terraces and residents as living water



Woody amaranth: guide water to irrigated paddy fields



Special bamboo tube: used to buffer the flow momentum, reduce water loss and soil erosion in the places with larger terraced waterfall gap



Water segregator vessel: a flat stone groove engraved with different widths according to how much water used by the lower terraced fields

**Figure 1-3-24 Irrigation tools in the four rice terraces in Longji and Lianhe terraces**

In Hakka and Ziquejie Terraces, there is a traditional irrigation tool called dragon-bone waterwheel (Figure 1-3-25). The uneven distribution of water in terraced fields forced farmers to take measures to resist the drought events, which led to the invention of dragon-bone waterwheels that are mainly used through manpower stepping to transport water from low-lying area to the higher altitude regions.



**Figure 1-3-25 Dragon-bone waterwheel in Ziquejie and Hakka Terraces**

## (4) Harvesting tools

The traditional tools for rice harvesting in these terraces include sickles, barrels, baskets, knives, scissors, poles, dustpans, huller, etc. (Figure 1-3-26)



Sickle: used for harvesting grain crops or cutting succulent forage.



Straw barrel: The chief tool for artificial harvesting of rice.



Grain basket: bamboo woven tools, Mainly used for transporting rice



Bamboo dustpan: commonly used tools for drying rice



Bamboo dustpan: commonly used tools for drying rice



Huller: an agricultural tool used to process to removing the chaff (the outer husks) of grains of rice.



Rice basket: used to load grain



Rice barrel: used to load and grain-husking



Rice scissors: a tool to harvest crops



Shoulder pole: be made up with mood to ferry grains



Rice harvesting knife: a tool to harvest crops



Manual rice-polishing device: a tool used to grain-husking

Figure 1-3-26 Harvesting tools in these terraces

## (5) Drying tools

Bamboo mat is a traditional drying tool in Ziquejie Terraces, which usually sets aside in the flat ground to facilitate the storage. Drying rice spikes are a drying tool in Longji Terraces, hanging rice on the tool. In the sunlight and wind the rice can be dry quickly (Figure 1-3-27).



Bamboo mat: used for drying rice and grain

Drying rice spike: hanging rice on the tool

Figure 1-3-27 Drying tools in Ziquejie and Longji Terraces

## (6) Processing tools

The traditional tools for food processing in these terraces include grain hopper, stone mills, stone mortar, drum windmills, water-powered trip-hammers, etc. (Figure 1-3-28)



Grain hopper: a traditional farming tool for rice threshing.



Grain screen: used to wipe out the debris arising from threshing.



Tulong: also called "leizi", a tool made of bamboo strip for removing rice peel



Chedui (a kind of stone mortar): also called "duichong", used for hulling rice.



Stone mortar: a tool used to mash rice







Stone mill: used for processing rice, wheat, beans and other grains into flour or thick liquid.



Drum windmill: also called fan, used for removal of skin and debris of rice and blighted grain.



Water-powered trip-hammers: used to process grains into clean, fine flours or rice with the power of water.

**Figure 1-3-28 Processing tools in these terraces**

## (7) Fishing tools

The traditional fishing tools in these terraces include different fishing baskets (Figure 1-3-29). There are several kinds of loach-catching tools (Figure 1-3-30).



**Figure 1-3-29 Fishing tools in these terraces**



Bamboo-waved loach-catching tool: a tool used to load loach



Loach-catching tool: a tool used to catch loach

**Figure 1-3-30 Fishing tools in Longji Terraces**

## (8) Others

The other traditional farming tools remained in these terraces include rain clothes, bamboo hats, wooden buckets, thick bamboo tube, mousetrap, etc. (Figure 1-3-31)





Straw cape: rain gear



Wooden bucket: mainly used for carrying water



Yangtong: used to carry rice seedlings.



Bamboo tube: mainly used to hold water or wine



Bamboo hat: mainly used as a shelter from the sun and rain. It is made by knitting bamboo.



Traditional mousetrap: catch the mouse

**Figure 1-3-31 Other tools in these terraces**

## **1.4 Cultures, value systems and social organizations (Agri-Culture)**

Different ethnic groups combined with distinctive natural conditions have developed diversified cultures, value systems and social organizations in rice terraces of subtropic China.

After migrating to Chongyi, Hakka ancestors opened up wasteland and built up fields along mountains to reclaim the magnificent Hakka Terraces. In a long productive life, the culture and folk customs of the local She and Yao ethnic groups are integrated based on the traditions of Hakka to develop the agricultural culture of Hakka Terraces which features the combination of Hakka and She customs with terrace cultivation as the main lifestyle.

The rice cultivation culture is the core of the Longji culture, and also the mainstay of the local ethnic culture. Through the transmission of the Longji Terraces Culture generation after generation, the historical and cultural memories involving kinship conceptions, spiritual beliefs, customs and habits are also absorbed into the terrace culture, the local history as well as social values are all engraved in the minds of all ethnic groups, and the social identity and cultural consciousness is thus bred intuitively. On this basis, the local kinship, villages and traditional livelihood centered around rice production are sustained and developed.

The Ziquejie Terraces located in a region that integrated rice culture and fishing & hunting culture inhabited mainly by Miao and Yao ethnic groups. The unique natural conditions, the rich natural resources, the traditional farming methods, the succession of many ethnic groups over a long period of time in this region, and together with many other factors, have resulted in the diverse and distinctive characteristics of the traditional culture in the Ziquejie Terraces.

The war breakouts in Central China in the history forced lots of population in these regions migrate into Zhejiang Province and then into Youxi County of Fujian Province. These immigrants brought a great many advanced agricultural technologies and cultures from Central China and used them to build terraces and develop agriculture. Meanwhile, they also created a series of agricultural tools and technologies adapting to local environment for production, and formed abundant cultures in harmony with nature such as food cultures, festivals and customs, worships and taboos, farming cultures.

### **1.4.1 Cultures**

#### **(1) Hakka Terraces culture**

The core of Chongyi Hakka Terraces culture is expressed in farming proverbs, farming sacrifices and beliefs, food culture, folk arts, costumes, architecture and folk customs. Of them, six unique cultures, including the Zhudong folk song of the She ethnic group, the production of yellow ginger tofu, the making rice wine and dragon lanterns, the spring cattle dance and Gaosheng (a religious activity), are recorded in the list of the intangible cultural heritages of Jiangxi Province.

## 1) Festivals and customs

The Dragon Boat Festival, Tomb Sweeping Festival, Ghost Festival, Mid-Autumn Day, Winter Solstice and Spring Festival are most important festivals to celebrate solemnly (Table 1-4-1). Of them, sacrifice in the Tomb Sweeping Festival and the Winter Solstice follows strict schedules and rules to show dignity.

**Table 1-4-1 Festivals and seasons in Hakka Terraces**

Festival	Date	Introduction
Spring Festival	From the 24 <sup>th</sup> day of the last lunar month to the fifth day of the first lunar month next year	Preparations include preserved pork, chicken, duck and goose, various fruits, distilled wine and fried tofu. People go back home for a family reunion no matter how far away they live.
Lantern Festival	On the 15 <sup>th</sup> day of the first lunar month	Also named as Shangyuan Festival, it features the dragon lantern, lion dance, martial arts, and spring cattle dance. People visit their relatives and friends or give a show on the streets to celebrate the festival until night.
Beginning of Spring	In accordance with the calendar in all ages	At the right moment, firecrackers are set off to welcome the spring, and the spring cattle dance is performed by the Tang family in Shangbao Township.
Double-Second Festival	On the second day of the second lunar month	Also known as the birds' festival. Villagers stick rice cakes on bamboo poles and insert them into farmland to feed birds in the hope that birds don't ruin the crops. As the folk song says, it is on the second day of the second lunar month to stick eagle's beak.
Tomb Sweeping Festival	The day after the Cold Food Festival in ancient times. Now it is specified in calendars.	As the day for clan members to offer sacrifice to their ancestors, it was as important as the Dragon Boat Festival, Mid-Autumn Day and Spring Festival in the old times, and is still of great importance.
Beginning of Summer	In accordance with the calendar	The transplanting season is marked by eating eggs in the Egg Eating Festival. As the saying goes: "Eating eggs at the beginning of summer makes people stronger to labor."
Dragon Boat Festival	On the fifth day of the fifth lunar month	It turns warm and breeds pestilence. Mugwort leaves, calamus and kudzu were hung on the gate in ancient times, and this time is thus called the Calamus Festival.
Double-Six Festival	On the sixth day of the sixth lunar month	It is hot enough to swim in pools, as the saying goes. Yam balls and taro balls are eaten on the festival, hence the name Yam and Taro Festival.
Ghost Festival	On the 15 <sup>th</sup> day of the seventh lunar month	Also named Zhongyuan Festival. People offer sacrifice for their ancestors and eat sour rice cakes.
Mid-Autumn Day	On the 15 <sup>th</sup> day of the eighth lunar month	Also known as the Reunion Festival. Moon cakes are eaten for the festival.
Double Ninth Festival	On the ninth day of the ninth lunar month	Rice cakes are eaten for the festival, of which the "nine layer glutinous paste" is commonly seen.
Ancestor	On the first day of the	At this time, crops are harvested and glutinous rice

Worship Festival	tenth lunar month	dumplings are eaten to appreciate the hard work of harvest. As the saying goes, on the first day of the tenth lunar month, glutinous rice dumplings are made and farm cattle stop working.
Winter Solstice	In accordance with the calendar	The weather turns cold and the farm families butcher animals for pickled meat. It is said that water collected after the Winter can be used for brewing wine.

## 2) Farming proverbs

The Hakka in Chongyi have a good understanding of terraces and follow the law of nature. They express the broad meaning of the “24 solar terms” and experiences from a history of laboring life in a plain language (Table 1-4-2). These proverbs give a vivid image of farmers honouring the farming practices without missing the season. Thus, their farming life is enriched for the Hakka with important spiritual wealth which has a very important practical significance and agricultural value to terrace farming.

**Table 1-4-2 Classification and samples of farming proverbs in Hakka Terraces**

Type	Sample
Guiding agricultural production	Don't reap the rice at the beginning of winter, otherwise you will harvest less day by day.
	Don't shovel the oil-tea camellia mountain in spring and summer, otherwise you will harvest less in autumn.
Forecasting weather conditions	If it's sunny in Grain in Ear, it will be rainy when the Summer Solstice comes. If it rains on Frost's Descent, it will always be rainy until the beginning of winter. If it rains at the beginning of winter, there will be less rain or snow throughout the winter.
Methods and techniques of farming	Pointing the plow tip to the cattle head will make it easy to plow. Plowing deeply and raking strongly will bring more harvest.
Traditional green farming experience	Pig manure and milk vetch are boons for plowing. Spreading straw in the field will make it more fertile.

## 3) Folk arts

The terrace is the origin of Hakka's wisdom and artistic inspiration. Traditional colored lantern making, drama and dance, folk songs and ballads, embroidery, wood carving and bamboo handicrafts saturated in the bamboo culture are all the artistic works created by the Hakka. These arts, all involving terraces, vividly describe the life and work of the Hakka in Chongyi.

Local folk songs have a unique style and their language is easy to understand, with a distinctive theme and character of the place. The Hakka sing songs for work or to express their inner feelings. Among them, the Zhudong folk song of the She ethnic group (Figure 1-4-1) is prevalent in Zhudong village of Nie country in Chongyi. It is the ballad in production and daily life, which is to express feelings. It is sung solo or as a duet, mainly for the performance of work and love life, and has been recorded in the intangible cultural heritage list of Jiangxi Province.



Folklore here is pure and simple, full of rich local flavor. Dialects are used to give a vivid description of characters, landscapes and customs. Cases in point include Legend of Terrace in Shangbao and Turning Kongzhou into Fengzhou, which are both folktales that tell the origin of terrace in a legendary but simple way.

Hakka women in Chongyi are adept in embroidery, while the men excel in bamboo weaving. Both the embroidery and weaving come with their own features.

Local women began to learn needlework, cutting and shelling ramie, and spinning ropes and threads in their childhood. When they are 15 or 16, they start to learn embroidery. They make use of colorless silk thread to embroider various kinds of patterns on a garment front, skirt front, shoe upper, shoe pad, swaddle belt and infant's hat to express their blessings (Figure 1-4-2). The coin pattern represents wealth, the “万” pattern longevity, and other flower patterns thriving and flourishing.



**Figure 1-4-1 Zhudong folk song of the She ethnic group**



**Figure 1-4-2 Embroidery**



**Figure 1-4-3 Bamboo weaving**

Bamboo craftsmen can make various kinds of utensils for farm families (Figure 48), such as baskets, rice sieves, bran sieves, flour sieves, paddy baskets and bamboo mats. The bridal sedan chair can be made either. The bamboo skin, after being splitted to expose different original colors, or dyed, is woven into patterns and characters symbolizing longevity, luck and wealth.

Carpenters can emboss patterns on objects. For instance, the walking stick can be carved with dragon, phoenix, qilin, lion, or elephant patterns and the picture of a century-old man holding a walking stick. A stonemason can make the stones into lions, qilins, elephants, tomb stuffs, gate piers, mortars, mills and spotted stone strips. These animals and characters look lifelike and realistic.

Colored lanterns popular in Chongyi include the dragon lantern, carp lantern, incense burning dragon lantern, alligator lantern, goose-headed dragon, lion lantern, qilin lantern, foal lantern, calf lantern and monkey lantern. Dragon lanterns are divided into three segmented dragon (Figure 1-4-4), five segmented dragon, seven



**Figure 1-4-4 Three segmented dragon performance**

segmented dragon, nine segmented dragon, purple dragon and snake dragon. The three segmented dragon and the manufacture skills of dragon lantern (Figure 1-4-5) have been recorded in the intangible cultural heritage list of Jiangxi Province.



Figure 1-4-5 The skill of manufacturing the dragon lantern

#### 4) Food culture

The Hakka in Chongyi is blessed with abundant food culture and customs. Both the ingredients and cooking skills are filled with wisdom, which present the Hakka’s exploration of the nature and inheritance of their traditional culture (Table 1-4-3).

Table 1-4-3 Hakka Food in Chongyi

Type	Content
Diet	Drinking tea, brewing wine and giving a feast
Food	Rice, bean starch sheets, soy-flour pieces, Huangyuan glutinous rice cakes, sweet potato slices, sweet potato flour and Botrychium virginianum powder
Dish	Enzyme tofu, yellow ginger tofu, stuffed vegetable, konjac paste, steamed pork with rice flour, steamed pork, egg sausage and egg noodles
Cake	Moon cakes, pastry, bean-shaped crisps, waxberry-shaped crisps, orchid-root-shaped crisps, Xiaozao crisps, cloud-shaped slices, bean cake and fried beans

Traditional feasts in Chongyi mainly serve fat, squid and sea cucumber. An old Chinese square table is set for the feast. People take their seats according to their seniority. When guests come to visit here, local families will move the tables outside and put them together to hold the “Hakka long-table feast” (Figure 1-4-6). This is the supreme way to entertain guests as a sign of family harmony and unity.

The Hakka in Chongyi boast a great variety of cuisines (Table 1-4-4). Of these, the nine-layer rice cake and Huangyuan glutinous rice cake are made of traditional rice, such as yellow husk glutinous rice, sticky glutinous rice, Dahezi rice, sorghum glutinous rice and short-legged



Figure 1-4-6 The long-table feast of the Hakka

Dahe rice.

**Table 1-4-4 Introduction of Delicacies in Hakka Terraces**

Name	Introduction	Sample Pictures
Bamboo rice	Mat grass and bamboo tubes are used as containers for rice, making it tastes fresh and delicious, not prone to go sour, and convenient to take out.	
Nine-layer rice cake	Rice from the terrace is steamed after being ground, dyed with plant pigments and overlain. The cake looks fresh, tastes delicious with rich nutrition. The four major colors, i.e. green, red, yellow and white, symbols of the four seasons respectively, represents the hope of greening, prosperity and happiness, harvest celebration, and purity and auspiciousness.	
Huangyuan glutinous rice cake	Also known as glutinous rice dumplings, this cake is made of Dahezi rice, a traditional species, through a complicated process. It looks either yellowish orange or milky white, and tastes smooth and fresh, not sticky or greasy. It doesn't paste the pot after a long time cooking.	
Yellow ginger tofu	This tofu adopts traditional craftsmanship through complicated procedures. Looking gold and tasting tender, it contains more protein, and is taken as a pure green food free from any chemical dyes. The delicious tofu also has the function of enriching blood, clearing heat, detoxing and preventing cough.	
Mugwort glutinous rice dumplings	The mugwort and glutinous rice are mixed before being steamed or fried. The dumplings look smooth and green, smell fresh, and tastes chewy but not greasy. With the unique flavor, they are helpful to warm the lung and spleen, dispel cold and remove dampness as a health care.	

**Rice wine:** As the saying goes that “wine is served first, followed by dishes, then staples”, the unique Hakka wine custom prevails in Chongyi. Wine is commonly drunk in daily life and used as a necessity in entertainment, business discussion, funeral affairs and wedding ceremonies. Local people are used to making rice wine, or watery wine, which is a must-learn for housewives. They follow the brewing process of soaking, steaming, cooling and storing in containers to make the sweet and mellow rice wine.

**Tea:** The Hakka have been accustomed to drinking tea since ancient times. Tea is an essential beverage in their daily life, which mainly includes black tea, Oolong tea and green tea. Uncaria tea, tea growing on cliffs, midday tea and bitter tea are also their choice. As an important beverage in entertaining, tea is used by the Hakka to toast guests and is served at their arrival.

Besides preparing various delicacies, the Hakka in Chongyi maintain a host of precious traditional food processing skills, such as the way to make yellow ginger tofu (Figure 1-4-7), extract homemade oil (Figure 1-4-8), brew rice wine (Figure 1-4-9), and make Huangyuan glutinous rice cakes (Figure 1-4-10).





Figure 1-4-7 Making yellow ginger tofu



Figure 1-4-8 Extracting handmade oil



Figure 1-4-9 Brewing rice wine



Figure 1-4-10 Making Huangyuan glutinous rice cake



## 5) Costume culture

As the Hakka in Chongyi keep working in the mountainous area for a long time, their costumes both conserve the traditions of their ancestors and carry out reform and innovation under the influence of the She and Yao ethnic groups. The costumes are simple, convenient and practical to wear, and most are in blue, black, gray and white.

**Casual dress:** As for men's wear, the top features buttons down the front, a shallow collar and long sleeves with narrow cuffs (Figure 1-4-11). The bottom has long pants with a wide crotch and shorts (also known as the ox head pants) that are pleated around the waist without a front fly. As for women's wear, the jacket is a side opening with a right lapel. Underclothes have buttons down the front and long sleeves without a collar. The bottom refers to pants with a wide crotch (pleated pants) and tie-cord pants (the waistband is pleated to fold the tie that is tightened and knitted when the pants are put on.)



Figure 1-4-11 Hakka costumes

**Shoes, hats and headwear:** The Hakka hats are very distinctive though lacking variety. In the cold days, men wear skullcaps and scarves, and the old wear the flap cap that Su Wu wore when he herded sheep. Women in their maidenhood wear a single plait. After getting married, they wear buns which are wrapped with a cherry-decorated handkerchief. The Hakka children wear exquisite lion-topped hats that demonstrate vitality to ward off evils and bear divine meanings in totemic aesthetics (Figure 1-4-12).

Patterns on the Hakka costumes follow those of the She ethnic group. Some villages in Chongyi where the Hakka and She culture are well conserved remain home to the traditional costumes that symbolize their cultural icons, such as the phoenix dress, apron and dragon shoes (Figure 1-4-13).



Figure 1-4-12 Hakka kids' hat and lion-topped hat



Figure 1-4-13 Traditional costumes of the She ethnic group in Zhudong Village (Text in the figure: 凤凰装 Phoenix dress; 男子服装 Men's wear)

## 6) Architecture

The main architectural form for the Hakka in Chongyi is mud huts. They basically follow the traditional style of the Han ethnic group in northern China in ancient times. Mud, wood and stone are the basic materials for building. Rammed earth or mud bricks are laid into the bearing wall, and wood is made into the girder that is covered with grey tiles. A base is tightly laid with stones and grey bricks. Among all the building materials, including mud, wood and stones, the former constitutes the main body and most fundamental materials of the Hakka building.

Mud huts are suitable to live in. They are stable, firm and not easy to deform. They are the most commonly seen with the most Hakka features. In addition, “Shangsan Xiashan” and “Jiuqing Shibating” (Figure 1-4-14) are featured mansion-style residence design, which symbolize the archi-culture of the Hakka. They are not only pleasing to eyes, but also contain the profound culture of Feng-shui and the family culture of the Hakka. The most featured historic building in Chongyi is the Aqua Tower in Niedu Township (Figure 1-4-15). It was built under the reign of Emperor Chenghua in the Ming Dynasty. The five towers are built with spotted stones that stand surrounded with water. It is regarded as today’s typical Hakka architecture, and the predecessor of the earth building and dragon house.



Figure 1-4-14 Jiuqing Shibating




Figure 1-4-15 Site of the Aqua Tower in Niedu




## (2) Rice culture of Longji Terraces

### 1) Festivals and customs

In addition to several major Chinese legal festivals, there are also some local festivals and customs with national characteristic (all the dates according to the lunar calendar) in Longji Terraces (Table 1-4-5).

**Table 1-4-5 Traditional national festivals and customs in Longji Terraces**

Name	Date	Introduction	Sample Pictures
Clay Cattle Festival	Beginning of Spring	As a Longsheng Dong Minority traditional festival, the main activity is to have Clay Cattle Dance. The people of the day will prepare meat, wine, rice, worship ancestral gods. After dinner, an activity called "sending spring cattle" will be held.	

Torch Festival	June and July	Torch Festival formed in the local villagers on the fire of the supernatural power of the original worship, known as the Oriental "Carnival". Activities are various in forms: bullfighting, wrestling, singing and dance performances.	
Plowing Festival	At the end of April or the beginning of May	The villagers hold a ceremony to worship the God, pray gods for providing good weather for crops, and also the festival is a big harvest; then they begin a-year of farming.	
Seedling Trimming Festival	Around Grain in ear	The villagers hold a worship ceremony for seedling trimming. Seedling god is the patron saint of the seedling. Through the ceremony, people pray for her bless to make the whole village get a big harvest, and a peaceful place.	
Folk Song Festival	On Luna March 3 <sup>rd</sup>	It's a celebration held in Huangluo yao Village. In this day, young boys and girls carefully are dressed up, and people cook colorful glutinous rice to welcome guests from afar. The climax of the festival is The link of singing folk songs.	
Hanging Clothes Festival	On June 6 <sup>th</sup>	After Spring Festival, the local second grand festival is Hanging Clothes Festival. It is the day for the dragon king to hang out his robes. In The day, the villagers will set up the bamboo poles or pull up the string out of the corridors of every wooden building, and hang out clothes for anti-virus and sterilization. At the same time, they will invite friends and families to their home and celebrate the festival together.	

## 2) Farming proverbs

Longji ancestors have created many agricultural proverbs with rich local and national characteristics during the generation of farming, the representatives are on the following:

"Whether there will be a harvest depends on water, and the degree of the harvest depends on the fertilizer": It means harvest of rice terraces rely on a sufficient irrigation, the degree of harvest relay on how much fertilizer is applied which reflects the basic role of water and fertilizer in terraced agriculture.

"Eating in January, playing in February, dubious in March": This is the summery and a joke of local agricultural law. January and February are slack farming seasons and March and April are hard and busy farming seasons.

"You are in the front and I am in the back; the wife is like a cattle in the front, the husband is shouting after her (shouting to make forward), the couple both sweat": it reflects the local coupling mode and hard work of operation. Coupling farming has been used in the way of "women pull plow in the front, men push plow in the back", and this farming technology requires a lot of manpower.

"Finding the water source and measuring waterway, measuring the mountain, deploying water and cultivating the field": it means that the ancestors of the local villagers would chose a place that abundant in water when doing land reclamation and digging. They also build pumps and dig irrigation ditches to guide the spring water from mountains to rice fields, reflecting the important role that water has served in the terraces agriculture.

"Ciba oil Malu in September 9": September ninth is a Double Ninth day, people use glutinous rice to steam Ciba, to celebrate the new harvest, reflecting the local festival culture and diet customs.

"A hat at the mountain top, a belt at the hillside, while a skirt at the mountain foot.": this is the most vivid description for magnificent scene and excellent ecology of Longji Terraces agricultural system.

### 3) Folk arts

Longji terraces farming system has colorful folk art, which is diverse in forms with rich national characteristics. The representatives are shown in [Figure 1-4-16](#).



Caidiao Opera



Shoulder Pole Dance



Shigong Dance



Bamboo Canister Dance



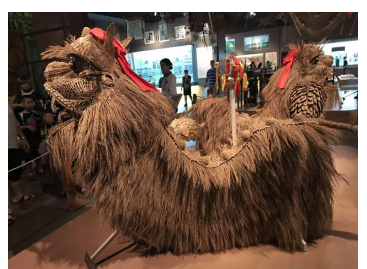
Wan Songs



Cloth Patch Embroideries



Rice Straw weaving



**Figure 1-4-16 Traditional national folk arts in Longji Terraces**

### 4) Food culture

The dietary culture is symbolized by the "Longji Sibao" (Four Longji Local Specialties: Yunwu



tea, pepper, fermented liquor and fragrant glutinous rice) (Table 1-4-6, Figure 1-4-17).

**Table 1-4-6 Traditional Cuisine of the Longji Terraced Areas**

Types	Ingredients and Cuisine	Example
Cooked Dish	vinegar-pepper, fresh and raw, cold-resistant, humid-resistant;	Raw fish, rice flour meat, boxthornleaf egg soup, etc.
Prickled	Vegetable pricked with salt with ginger, fermentedsoyabeans, etc. as additives	egg plant skin, white pepper, Longji chopped pepper, etc.
Preserved meat snacks	Animal meats prickled or smoked or fire-cured Snacks as take-away or eaten between meals made from fern root, tonghe rice, glutinous rice, corn, etc.	Preserved meat, baked fish, dried salted duck, etc. Fern cake, Gulin noodles, Luoshifen (snail powder), etc.
Tea	Longji tea, wild tea, Momordica grosvenori, insect shit tea, etc.	Longji Green Tea, Longji Red Tea, Momordica grosvenori tea, insect shit tea, etc.
Liquor and wine	Brewed with tonghe rice through soaking, boiling, and sealed jar fermentation	Longji fermented liquor (Oriental Magic Water ), Sweet dregs wine, rice distilled spirit, etc.



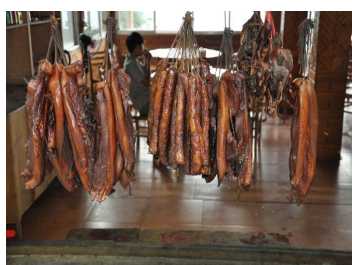
Raw fish



Longji Red Tea



Bamboo rice



Preserved meat



Gulin noodles



Sour fish

**Figure 1-4-17 Traditionally special food in Longji Terraces**

## 5) Costume culture

Women's clothing of Zhuang and Yao ethnic minorities are the main stuff embodied with national characteristics. Women's clothing in Zhuang ethnic minority is divided into casual cloth and formal dress. Casual dresses are various in different seasons, and women of different ages are also different in clothing. Young women mainly wear white lapel-based clothes in summer and women in middle-aged wear black-based clothes in winter. Formal dresses are only dressed on important occasions like marriage or seeing the bridegroom off: the shirt upper and the skirt under, and the skirts are pleated skirts down to ankle, with full set of jewelry like collar, bracelet, and silver lock. They are priceless

treasure passed from generation to generation. Hong Yao women's clothing generally including a black scarf for head, a pink short jacket, and a pink belt around the waist, as well as the black leggings for shanks. Young women's jacket is decorated with rhombic stripes. cuffs, their chest and overlapping are random decoration of pile dwelling. For Hong Yao clothing, silver jewelry is essential. Generally, people wear silver combs, silver rings, and silver bracelets(Figure 1-4-18).



Hong Yao pink short jacket



Hong Yao women's clothing



Zhuang costume



Daily costume



The old's costume

Figure 1-4-18 Traditional costume in Longji Terraces

## 6) Architecture

The Longji Terraces culture cover not only the rice-centered agricultural production and its related culture, but also the emotional sublimation and unique life significance derived from the rice culture soaked in every corner of the local social life more importantly. The Zhuang and Yao people of Longji have been cherishing the local ethnic culture full of magnificent carriage just as they do with terrace buildings and protection, the architectural culture embodies in the stilt houses or pile dwellings, the stone culture signified by the tablet inscriptions and flagstone paths (Figure 1-4-19).



Figure 1-4-19 Traditional architectures in Longji Terraces

### (3) Rice culture in Ziquejie Terraces

The traditional culture in the Ziquejie Terraces is mainly expressed by festivals and customs, Farming proverbs, Folk arts, food culture and Architecture. Some of them have been recorded in the list intangible cultural heritages at county, city, provincial or even national level (Table 1-4-7).

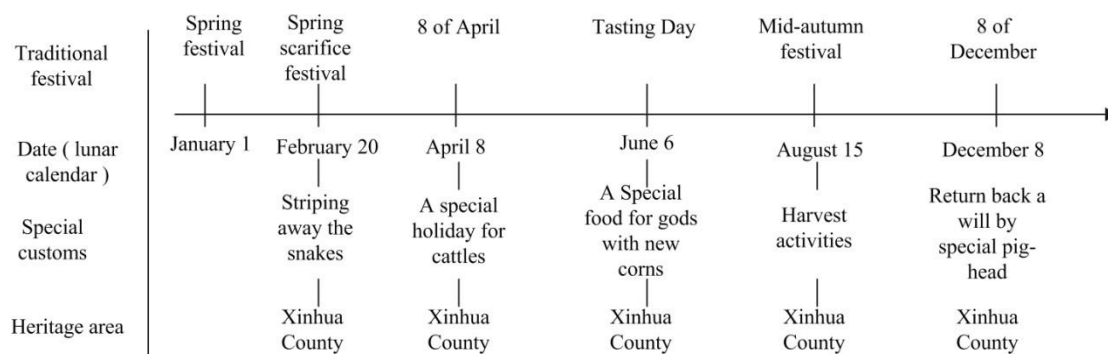
Table 1-4-7 List of the Intangible Cultural Heritage in the Ziquejie Terraces

Level	Number	Examples	Notes
National level	2	Xinhua Folk Songs, Martial Arts of Meishan	
Provincial level (Hunan Province)	2	Xinhua Folk Songs, Martial Arts of Meishan	Including national level
City level (Loudi City)	2	Hometown of Chiyou, Waters of Meishan	
County level (Xinhua County)	15	legend of Tianzishan Mountain, Sanhe Soup, Bamboo Weaving of Meishan, Changxin Festival, Meishan Elegy, Nuo Lion Mask Dance, Meishan Nuo Opera, Bamboo Drama of Xinhua, Di Hua Drums, Xinhua Printmaking, Meishan Medicine	Including provincial level

#### 1) Festivals and customs

Special festivals and customs of the Ziquejie terraces are listed as the following (Figure 1-4-20):





**Figure 1-4-20 Festivals and customs of the Ziquejie Terraces**

**a. Eating Glutinous Rice Cake on Spring Sacrifice Day**

The Spring Equinox is named as Spring Sacrifice Day by Xinhua people, which signals the coming of spring. This is also a time for snakes and other pests to wake up from their winter hibernation. Therefore, people would use glutinous rice cake to stick the pests in their holes with the hope to prevent them from harming the agricultural production in the coming year. This practice has gradually evolved into the custom of eating of glutinous rice cake on Spring Sacrifice Day.

**b. Celebrating the Birthday of Cattle on April 8th of Lunar Calendar**

Cattle have very important position in the hearts of Xinhua people. Xinhua people believe that April 8th of lunar calendar is the birthday of cattle. On this special day, both farmers and cattle are given a day off from working to show the respect and care of farmers for the cattle.

**c. Changxin Festival**

Changxin Festival means a holiday for tasting the newly harvested rice. On June 6th of lunar calendar, Xinhua people make glutinous rice cake from the newly harvested rice to sacrifice for gods and also to pray for a good harvest in the coming year.

**d. Middle-autumn Festival**

In Xinhua, except for the common customs of eating moon cakes during the Mid-Autumn Festival, local people carry on some other activities, such as Burning Pagoda, Stealing Vegetables from the Fields, Praying for Children. Burning Pagoda is a special way to set off fireworks by building hollow pagoda piled with crocks, burning firewood inside, and throwing powder mixed with sulfur, charcoal, saltpeter to it. Stealing Vegetables from the Fields is a traditional rule that people are allowed to pick up vegetables and fruits from someone else’s garden and eat them, as long as they don’t take them away. Among them, Preying for Children it is a unique folk activity to Xinhua and is also very popular. Children dress up a wax gourd as a boy, and then put it on the bed of the people who has no baby. Then, they will help the host to prey for babies by playing some naughty games. This activity is highly welcomed and enjoyed by both adults and children in Xinhua County.

**e. Slaughter of Pig on the Laba Festival**

Farmer households slaughter pigs on December 8th of the Lunar Calendar and to thank the protection and bless of Meishan gods by redeeming a vow to a god with pig heads. This ceremony is also performed to pray for bumper harvest and thriving of domestic animals in the coming year. When the ritual is completed, a huge pot of “pork blood soup” shall be prepared, and friends shall be invited to share this delicious meal. Meanwhile, cooked pig blood shall be distributed to neighbors.



## 2) Farming proverbs

Local farmers in Ziquejie has sum up the valuable experience during their long-term agricultural practice, and formed a large number of farming proverbs. For example, “Xiao Man Ri Cha Ri, Mang Zhong Shi Cha Shi”. According to this farming proverb, we can know that the rice seedling transplantation for the middle-season rice shall be completed between the Beginning of Summer Festival to Grain Full Festival in May, which is about half-month. Significant impact would be made on the growth and yield of rice if the rice seedling transplantation is delayed for one day, or even for one hour. There are lots of farming proverbs produced in Ziquejie, for example, “the soil shall be plowed by the iron plate and the mud shall be deeper than one’s ankle”, “ploughing in the field three times makes the rice rounded like full moon”, “ploughing in the field on sunny days is better than manure while ploughing in the field on rainy days is worse than relaxing at home”. From these farming proverbs we can see that intertillage weeding is an important field management measure to be used during the tillering period, and intertillage weeding shall be conducted in sunny days.

## 3) Folk arts

### a. Grass Dragon Dance

Dragon made of vanilla is closely related to the rice terraced culture in the Ziquejie Terraces (Figure 1-4-21). Local people take this kind of grass dragon as the incarnation of god of cereals, and the Mother Goddess, who are protecting the prosperous harvests, household security, and prosperity in the Ziquejie Terraces. Whenever serious pests or drought occur, people go to the fields to dance with grass dragon to pray for controlling the pests or resisting the drought. During the Spring Festival, grass dragon dance come into each household to pray for gods’ blessing for the safety and prosperity of their families. After dance in each household, the host shall send a red envelope, glutinous rice cake, and other gifts to the dragon dancers, then set off the firecrackers to send the dragon off.



Figure 1-4-21 Grass dragon dance

### b. Meishan Martial Arts

Meishan martial art is already listed as State-level Intangible Cultural Heritage of China, which fully reflects the folk life and cultural traditions of the Meishan region. Meishan martial art was formed in the harsh natural environment and social environment of frequent fighting. Historically, the ancestors of Meishan area gradually formed a simple and practical martial art school in the daily life and production process which featured defense-based and capable of both attack and defense. Among them, the martial art in the Ziquejie Terraces has the unique styles. First, in terms of the



Figure 1-4-22 Meishan Martial Art

instrument used, there are pitchforks, iron rakes and iron rulers used in hunting as well as wooden benches, square table sticks, long chimney, umbrellas, and other things for daily use. Secondly, many of the martial art techniques and actions have evolved from the daily farming and hunting labor and other production processes (Figure 1-4-22).

### c. Xinhua Folk Songs

Xinhua folk songs are also listed as State-level Intangible Cultural Heritage of China and widely distributed. Folk songs in the Ziquejie Terraces has the features of high tunes, loud and clear singing, which is the unique folk songs that can only be found in Xinhua County (Figure 1-4-23). In ancient time, the reclamation of terraced fields was generally conducted at areas far from the villages. Therefore, when people went to work in the terraced fields, particularly those close to the forest edges and untraversed regions, they might encounter wild beasts



Figure 1-4-23 Xinhua Folk Songs

and other animals, which would bring extreme danger to them. Therefore, people might beat the gongs or chant or sing the folk songs to scare away the animals in lurk; at the same time, singing folk songs can effectively relieve fatigue during the labor and make the farmers relax. Xinhua Folk songs have a close relationship with the daily life. A lot of folk songs in the Ziquejie Terraces describes the daily production and labor scenes, such as the “rice planting song” that boasts the production process in terraced paddy fields, and the “Brother is hunting birds in the mountains” that depicts the hunting process.

## 4) Unique hot and sour food culture

With the relative high altitude, abundant rainfall, and cloudy weather throughout the year in the Ziquejie Terraces, it is difficult to preserve fresh food for a long time because of the relative high air humidity. Besides, local farmers need to prevent rheumatic diseases in everyday life. In practice, people effectively prevent rheumatic diseases by reasonable diet consisting of pickled cabbage, pepper, and wild pepper. As a result, a hot and sour diet was formed, taking “dispelling dehumidification and sweating to decrease internal heat” as the main characteristics. Meanwhile, preservation methods such as salted or smoked after salted are used to preserve food (Table 1-4-8).

The overall characteristic of traditional food culture in the Ziquejie terraces is formed based on the local products and also adapted to the characteristics of local natural environment. Local snacks are mainly made of special products of the Ziquejie terraces, such as sticky rice, finger millet, buckwheat, fern root and other unique products. At the same time, for the convenience of carrying and eating, most snacks are made into the typical form of stuffed bun which is commonly seen in southern areas. Tea, rice wine and cold drinks are to the main beverage form with local characteristics. There are Gong tea, mashed tea and barley tea. The main type of rice wine is the brewed sticky rice wine specialty made of the glutinous rice produced in the Ziquejie Terraces. The cold drink is a kind of unique drink made of the fruits of Liangshu Tree—a endemic vines in this region (Table 1-4-8).

The typical “ten courses of meat, ten courses of vegetables and ten kinds of drinks” is very famous in this region. The “ten courses of meat” include Sanhe soup, snow balls, pounded duck, rice flour meat, vinegar and sour fish soup, mud fish with tofu, duck bun, steamed duck with chestnut, pig’s blood bun.

The “ten courses of vegetables” include glutinous rice cake, raw rice bun, rice cupcake, Ma Lianhuang, coarse cake, glutinous rice starch, fern root cake, fried rice and peanut bun, rice powder with pepper, navel shape bun. The “ten kinds of drinks” include fermented glutinous rice wine, sweetened distilled grain wine, sweet wine, rice liquor, cellar wine, barley wine, cold drinks, mashed bean and *Gynostemma pentaphyllum*. There is a very special course named Frozen fish that you can only find in Shuiche Town (Figure 1-4-24).

**Table 1-4-8 Traditional Food Culture in the Ziquejie Terraces**

Category	Illustration	Examples
Smoked products	To conduct salted and smoked preservation methods on home-raised livestock, poultry and fish to ensure easy preservation	firewood smoked meats, smoked duck, fire roasted fish
Salted products	Salted vegetables, supplemented by ginger, salt black bean and other condiments	Eggplant peel, white pepper, chopped hot pepper, thick chili sauce, radish salted with thick chili sauce, salted vegetables
Style of cooking	A cooking style combined local properties and went through long-term development and evolution that has become one of the important cooking schools of Hunan province with a sour and spicy characteristics and the function to eradicate cold and dehumidification	Sanhe soup, snow balls, pounded duck, rice flour meat, vinegar and sour fish soup, fish gel, mud fish with tofu, duck bun, steamed duck with chestnut
Snacks	made of special products of the terraced region, such as purple rice, sticky rice, finger millet, buckwheat and other unique products, has the character of being convenient for carrying and eating	glutinous rice cake, raw rice bun, rice cupcake, pig’s blood bun, Ma Lianhuang, coarse cake, glutinous rice starch, fern root cake, fried rice and peanut bun, rice powder with pepper
Beverages	Made of tea, soil bean, barley and Liangshu vein specially produced in this region, has the functions of quench the thirst and satisfy the hunger	Meishan Gong tea, <i>Gynostemma pentaphyllum</i> tea, moon-shape tea, cloud and mist tea, mashed tea (three kinds of beans and three kinds of rice), barley tea and cold drink
Liquor drinks	Made of carefully selected sticky rice of high quality produced in local area as raw material through the processes of soaked, steamed, jar closure and other elaborate traditional crafts	fermented glutinous rice wine, sweetened distilled grain wine, sweet wine, rice liquor, cellar wine, barley wine



Frozen fish of Shuiche Town



Sanhe soup



Snow balls



Coarse bun with steamed chicken

**Figure 1-4-24 Traditional food culture**

## 5) Traditional villages featured by plank houses

The traditional folk houses in Ziquejie Terraces are ganlan-style plank houses with two stories and exterior wood walls. Gable walls on both sides were made of bamboo and painted in white, and the roof was covered with small black and green tiles (Figure 1-4-25). From a distance, it seems that the entire wooden buildings in the village are concentrated and densely arranged, but with a close look you would find that each independent building has a small courtyard that provides enough space for drying crops and planting vegetables, fruits, or even feng shui trees. Individual houses are connected by stone roads leading to every corner of the village. The most well reserved traditional villages in the Ziquejie Terraces are Louxia Village and Zhenglong Village. Louxia Village is located at the north of the Shuiche Town, with a long history that can be traced back to Jianglong period of Song Taizu (960-963 AD). It is listed as one of the provincial historical and cultural villages in Hunan province. Zhenglong Village, located at the northeast of Shuiche Town, is now listed as one of the traditional villages of China too. A large number of ganlan-style plank houses were reserved in Zhenglong Village. Most of them were built in years between the late Qing Dynasty and the early Republic of China, and had a history for almost one hundred years.

People in the Ziquejie Terraces pay special attention to the construction of their houses. Before the selection of the house location, a geomancer shall be invited to check out the geomancy (Feng Shui) of the house, mainly to see whether the construction site would match the birth date of the owner. When the construction site is determined, a good timing to start construction would be selected too. After the house foundation is built, a cock is killed when the frame of main gate is erected, and a piece of red cloth written with “North Star will always shine” shall be hanged on it. Firecrackers shall be set out when the cross beam of the house is erected, and the host shall offer a feast for all the construction worker to “satisfy their appetite”.



Figure 1-4-25 Traditional folk houses



## (4) Rice culture in Lianhe Terraces

In Lianhe Terraces, many cultural forms were created by the local people with agricultural production, including festivals (Figure 1-4-26) and customs, farming proverbs, folk arts like folk music, cuisine, etc.

### 1) Festivals and customs closely related to agriculture

#### a. Festivals

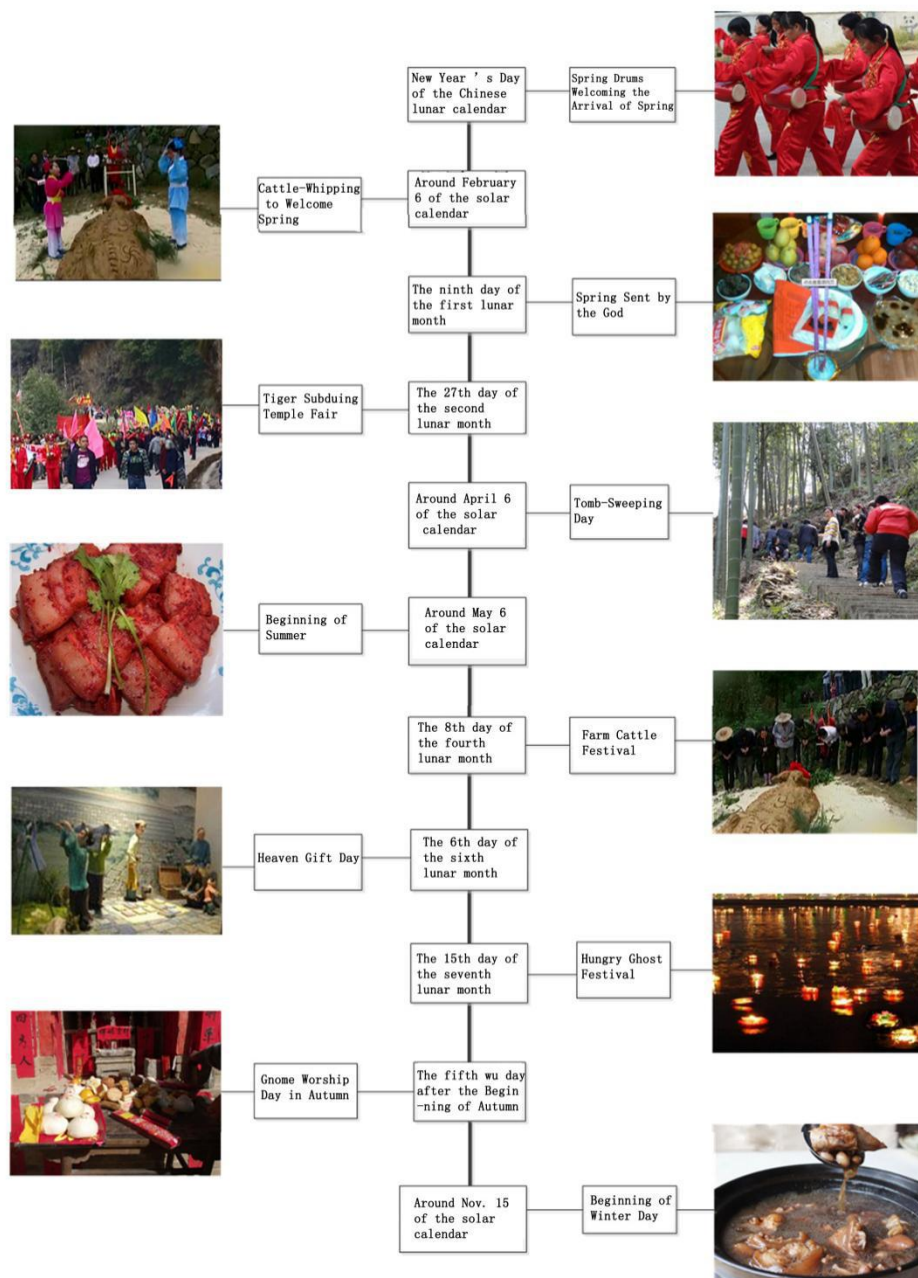


Figure 1-4-26 Main Festivals in Youxi

**Spring Drums Welcoming the Arrival of Spring:** The Spring Drum, also known as “bell and drum”, is very popular in Youxi. It can be seen in both large and small villages. In villages in Youxi, an ancestral house shall be equipped with one bass drum and two gongs. People consider the drum as the “heart of house” and the gong as “gallbladder”. From the first day to the fifteenth day of the first lunar month during Spring Festival, each house plays the “Spring Drum” to welcome the arrival of New Year and pray for peace for the whole year. When large worship ceremonies are held by a family, the drum is played as a musical instrument for ceremonies to create atmosphere.

**Cattle-Whipping to Welcome Spring:** Youxi has had the custom of whipping cattle on the Beginning of Spring since Tang and Song dynasties (Figure 1-4-27). The event is held by the authority and has fixed ceremonies. Soil cattle and Goumang God begin to be moulded after the Beginning of Winter; soil cattle and Goumang God are welcomed at the etiquette door of the yamen (government office in feudal China) in the afternoon before the Beginning of Spring. The cattle-whipping ceremony officially begins in the morning of the Beginning of Spring. After the ceremony, the public take some soil home and scatter them in the field or flowers and trees in the yard, meaning that they welcome spring and get good fortune.



**Figure 1-4-27 Cattle-whipping to Welcome Spring Ceremony**

**Spring Sent by the God:** The custom of worshiping the god on the ninth day of the first lunar month in Youxi has been in existence since ancient times without interruption. The god means the Jade Emperor. The ninth day of the first lunar month is the Jade Emperor’s birthday which is also called “Jade Emperor’s Birthday”, “Jade Emperor’s Day” or “God’s Day”. On the day, as people live in suites now, they put incense, candles and offerings in the balcony. Most offerings are vegetarian food. There are “five fruits” (orange, tangerine, apple, banana and sugarcane), “six vegetables” (day lily, agarics, mushroom, flowering cabbage, pea and Tofu), noodles, white cakes and a live carp. When the time’s right, all family members dress up neatly and offer incense by order of seniority. They burn gold ingots for the Jade Emperor, set off firecrackers and release the live carp in the pool or river.

**Beginning of Summer Day:** The Beginning of Summer is the beginning of summer. It’s an important solar term when the temperature significantly rises, the hot summer comes, thunderstorms increase, and crops grow fast. On this day, peasants cook pork in wine sauce and eat it with rice. They eat glutinous rice and rice cakes stuffed with bamboo shoots, hoping they’ll have an abundant harvest. These foods give legs strength; it’s called “skeleton building” or “legs strength building”. People in some villages eat pounded rice cakes stuffed with bamboo shoots and vegetables which are called “summer cakes”.

**Farm Cattle Festival:** The 8<sup>th</sup> day of the fourth lunar month is the Farm Cattle Festival. Some villages and towns call it Cattle Birthday (such as Lianhe Township) and some others say it’s the day when the cattle eat holy peaches (such as Xinyang County). On this day, peasants don’t let cattle work. They let cattle eat grass in the field early in the morning, hoping cattle get healthy and strong.

**Heaven Gift Day:** It falls on the 6<sup>th</sup> day of the sixth lunar month. There’s a saying in Youxi that “goblins dry medicine in the sun on the 6<sup>th</sup> day of the sixth lunar month”. The hot sun is high in the sky with a high temperature and dry air. This weather is suitable for basking clothes, quilts and books to

remove moths and fish moths. It's also good for health. The custom of drying clothes and quilts in the sun is popular in Youxi. Scholars dry books, scripts and paintings, hoping that they don't get mildewed or be eaten by moths throughout the year. Therefore, it's a custom for people in Youxi to dry clothes and quilts in the sun on this day, and scholars dry books, scripts and paintings, hoping that they don't get mildewed or be eaten by moths throughout the year.

**Hungry Ghost Festival:** People in Youxi call it "Mid-July Days", i.e. the 15<sup>th</sup> day of the seventh lunar month. It's also known as "Spirit Festival". It's originally a religious festival when people hold a memorial ceremony for souls of ancestors. It's said that people found shelters in mountains in turbulent days in ancient times. People of different family names met in adversity and treated each other like relatives. They celebrated festivals in turn. Therefore, nowadays the date when people celebrate "July Festival" is different in Youxi. People kill ducks, pound rice cakes and cook salty long-shaped rice cakes when preparing offerings for the ancestor worship ceremony.

**Gnome Worship Day in Autumn:** The Gnome Worship Day in Autumn falls on the fifth wu (the fifth of the ten Heavenly Stems) day after the Beginning of Autumn. The autumn gnome worship is in relation to the spring gnome worship, among which the latter celebrates a harvest and the former pray for a harvest. On this day, peasants meet and worship the gnome to thank him for deigning a bumper year to the world. In the agricultural society where people "live at the mercy of the elements", peasants worshiped the gnome before the spring ploughing and after the autumn harvest in order to pray for and thank "Heaven" and "Earth" for blessings. In case a relative passes away before the Gnome Worship Day in Autumn of that year, people should choose an auspicious day to worship the new tomb few days before the Day.

**Beginning of Winter:** It marks the beginning of winter and the end of field work of the year. After the Beginning of Winter, peasants start to be engaged in water conservancy capital construction and other farm work. Eat "winter sticky rice balls" to celebrate the harvest and stew meat with herbs to "nourish body".

**Tiger Subduing Temple Fair:** The Tiger Subduing Temple Fair in Lianhe is held on the 27<sup>th</sup> day of the second lunar month every year. It has a history of over 800 years since the Song Dynasty. The temple fair formally begins on the 27<sup>th</sup> day of the second lunar month. In fact, relevant ceremonies begin on the 1<sup>st</sup> day of the second lunar month, such as fast, getting incense from the Tiger Subduing Temple, and setting Taoist sites for service by Taoist priests. People pray for protection from tigers, good weather for crops, an abundant harvest of all crops, peaceful villages and harmonious towns (Figure 1-4-28).

#### b. Customs

Youxi has many mountainous regions with small terraces scattering on slopes. Some fields are so small that only three or five branches of rice seedlings can be planted in them. There's a saying that "a bamboo hat can cover three fields". Certain production customs gradually form among people in Youxi under the natural conditions (Table 1-4-9).



Figure 1-4-28 Worshipping the Chan master who subdues the tiger

**Table 1-4-9 Introduction of customs in Lianhe Terraces**

Name	Characteristics
Ground breaking	Choose an auspicious day for ground breaking at the beginning of a new year, i.e. “breaking the ground” in one’s own field. Hoe the field, burn incense and offer several strips of white papers to thank the gnome and pray for a harvest.
The first day of rice transplanting	The planter eats two eggs for breakfast and each of his families eats one egg as well as vermicelli, wine and dishes. The egg is called “Egg for Farming”.
Autumn Insertion	The peasant fastens a slip of white paper to the tail of the bamboo pole and inserts the pole in the field. They also prepare cakes or rice balls and pork to worship the gnome to pray for a harvest.
Birds and beasts expelling	Set up scarecrows in fields to frighten birds away. Put bamboo sounders in fields when rice and sweet potatoes are about to ripen to prevent them from being eaten by wild boars. The bamboo sounder makes rhythmic sounds by hydraulic power to frighten wild boars away.
Tasting new rice	When eating the first meal of new rice every year, fill a bowl of new rice to worship the gnome as an expression of gratitude.
Return Banquet	People in Youxi were not rich before, and it’s hard to raise pigs, so they seldom ate meat. When the pig is grown up and butchered, people cook “duck blood for worship” and send it to neighbors to have a taste. They also prepare a feast and invite relatives and friend to gather to improve their diets. Most dishes are made of pork and haslets. They also give some fresh pork to relatives.

## 2) Farming proverbs for agricultural production

Farming proverbs are the experience about agricultural production learned during the production process of local people. The farming proverbs are simple and rhyming and catchy. The farming proverbs spreading at Lianhe Township quite comprehensively describe the features of local agriculture. For example, “Home is home, be it ever so humble” and “The woodcutter knows everything happened in the mountain” reflect the mountain farming of Lianhe Township. “Cherish the lamp oil and treasure the farm cattle” indicates the importance of farm cattle to the local farming activities. “It’s time to sow before and after the Tomb-Sweeping Day” and “The wheat becomes ripe on the Tomb-Sweeping Day” reflect the farming activities in different seasons. “Rains is much terrible than the ghosts on the 15th of the seventh month in lunar calendar” particularly indicates the harms of rain to crops in the midmonth of the seventh month in lunar calendar at Youxi. “Have radish in winter and ginger in summer will keep the doctor away” explains the healthcare functions of healthy balanced diet to people’s body in different seasons.

## 3) Folk arts featured by folk songs and bamboo and wood sculpture

### a. Local folk song

Local folk song is considered to be an art form which is the most close to life and composed in the long-term production and life process of the local people. In the terraces region at the foot of Jinji Mountain in Lianhe Township, there are numerous folk songs being passed down from generation to

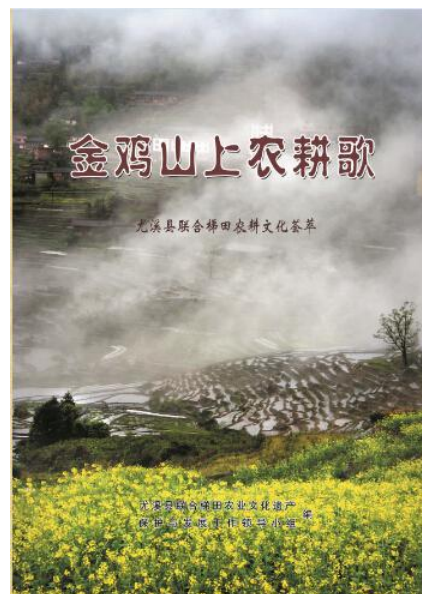


generation. The lyrics of those folk songs contain much information about the local farming activities. The *Song of Farming Season* particularly describes the farming activities of each month and main crops. In addition to the *Song of Farming Season*, the folk songs like *Plowing Song*, *Figure out Climate by Solar Terms*, *Song for Flower Festivals of Twelve Months* and *Song of Cowherd* spreading there also depict the local farming activities and growing seasons of animals and plants (see [Attachment 4](#)) ([Figure 1-4-29](#)).

#### b. Bamboo and wood products

People in terraces have long been living in a compound agroecological system comprising forest, field, village and river. They create many folk crafts using products produced in the compound system.

Youxi abounds in bamboo. Many farmers in Lianhe Terraces can plait handicrafts using bamboo ([Figure 1-4-30](#)). Fine products weaved by bamboo are baskets, dustpans, sieves, bamboo hats, baskets (for gift shoulder pole), summer sleeping mats, dish covers, etc. There are also daily living equipment like bamboo beds, bamboo chairs, bamboo tea tables, dish covers, tripod brushes, bamboo brooms and bamboo chopsticks, and ropes and torches weaved by bamboo skins. These products are marvelous and exquisite.



**Figure 1-4-29** Collection of folk songs, farming proverbs and poems



**Figure 1-4-30** Handicrafts made of bamboo and wood

#### c. Folk straw-weaved and rattan-weaved products

Folk straw products include straw mats made of mat grass and the paillasse and straw sandals made of rice straws. The most famous straw mats are Xiayang (within present Xinyang County) straw mat, Sufeng (within present Zhongxian Village) “Sushe Mat”, Shanlin (within present Zhongxian Village) “Xiping Mat” and Meixian Ping Village Mat. Straws used to weave straw mats are the wild rock grass growing by streams or in cliffs or the mat grass artificially planted in ponds. The former is woven into mats after boiling, heating and drying, and the mat is smooth, non-absorbent and pollution-free; the latter is split and woven into mats and the mat is thick and durable.

Rattan-weaved products in Youxi include rattan chairs, rattan cases and rattan beds. Rattan products, especially those from Guanqian, are durable.

#### d. The folk kirigami

The folk kirigami in Youxi has a long history. There are generally two types of paper-cut: paper-cut pasted on panes and decoration papers for oblations and gifts. The paper-cut pasted on panes has various patterns including twelve Chinese zodiac signs, dragon and phoenix, mandarin ducks and a

pair of lovebirds, the magpie announcing good luck, Kylin bringing auspicious signs, plum blossoms welcoming spring, riches and honor, more children and happiness, auspicious flowers and grass, as-you-wish and double happiness, etc. Patterns on decoration papers for oblations and gifts are simple. These papers are inserted in the chicken's mouth, covered on the chicken's back (known as chicken coat in Meixian), wrapped around the chicken's feet, or put on oblations like cakes and noodles.

#### 4) Food culture featured by rice and pickled food

Youxi Lianhe Township is rich in rice. The main rice varieties are indica rice, japonica rice and glutinous rice, so local people feed mainly on rice. The foods processed with varieties of rice are of great local characteristics, such as white kuih processed with the flour of japonica rice (commonly known as dahe rice, kuih rice), and turnip kuih made from turnip strips and japonica rice flour; rice wine and red wine brewed with glutinous rice, ciba made from steamed and mashed glutinous rice, wormwood kuih made from wormwood and glutinous rice flour; rice vermicelli, nine-layer kuih, rice gelee and golden kuih made from mashed indica rice (Figure 1-4-31).

In addition to the foods made from rice, there are also some foods processed with wheat and cereals produced on terrace, such as fried "mouse" (a kind of fried food looks like mouse) and chopsticks noodles processed with wheat (Figure 1-4-31), sweet potato vermicelli made from sweet potatoes and mashed taro processed with betel nut taro (Figure 1-4-31). They are also unique Youxi foods. The ways of cooking these foods came into being after long-term attempt and summary of Youxi people of thousands of years.

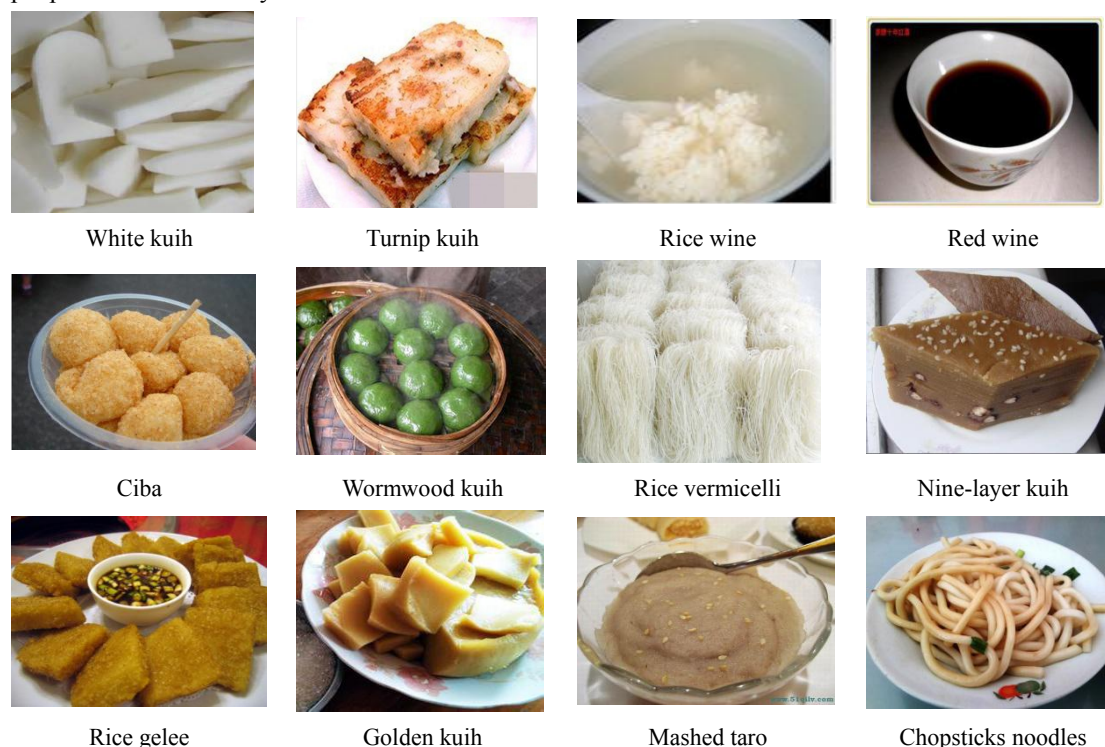


Figure 1-4-31 Special Youxi snacks

The cooking methods of foods are and various and also dainty. In addition to various seasonal fresh vegetables, meat of livestock and poultry and eggs, another specialty in Youxi is the cured products by peasant families, such as sauced salty bamboo shoot cured with fresh bamboo shoot, Youxi

dried salted duck and preserved duck sunned and cured with duck meat, smoked duck (Figure 1-4-32), smoked rabbit meat, loach rice vermicelli made from loach and rice vermicelli (Figure 1-4-32), and preserved vegetables and ginger in vinegar are also of great characteristics of Youxi. Seasonings are also unique, such as Youxi people's favorite Chinese scallion and garlic in vinegar. Youxi people also pay much attention to dietary therapy and health care. They often stew meat with angelica, radix astragali, ginseng, dried radix rehmanniae and other traditional Chinese medicinal materials to ward off diseases and keep fit, which are typical nutritious soups, such as grass roots soup stewed with pork and various grass roots (Figure 1-4-32).



**Figure 1-4-32 Special Youxi dishes**

The raw materials of above special Youxi foods are all produced from Lianhe terrace system. The raw material of red loach rice vermicelli, red loaches only grow in a certain field in Lianhe Township, so you can only eat red loach rice vermicelli in Lianhe Township.

## 1.4.2 Value systems

### (1) Value systems of Hakka people

The Hakka in Chongyi take geomantic omens (or Feng-Shui in Chinese) seriously. Agricultural sacrificial rites can be found throughout the farming process, from plowing, rice transplanting, fertilizing to harvesting. The spring cattle dance, Gaosheng (a folk religious activity) and cattle burial all represent different forms of the rites.

Apart from traditional Taoism and Buddhism, Hakka religious belief also involves Confucianism and a variety of folk beliefs with ancestor worship as typical characteristics. A case in point is that cattle are seen as the totem. Local people also honour the traditional concept of respecting the ancestors and the family God. They worship Land God, Door God, Kitchen God, Shangbao Altar God and Lord Wenchang to pray for favorable weather and a bumper harvest.

**Spring Cattle Dance.** The cattle dance at the beginning of spring is regarded as an important ceremony that kicks off farming for the year (Figure 1-4-33). When the farming season approaches,



cattle teams in kin units parade in the village and perform the ceremony of the cattle dance as the worship of the Heaven, the Earth and the God of Nature. A street banquet is held for people to dine and wine together as a sign of unity and to pray for heavenly blessings. The folk dance of cattle reflects the worship and appreciation to the totem of cattle by the Hakka people in Chongyi, and extends their wishes and blessings for a bumper harvest and thriving livestock.

**Gaosheng.** Gaosheng refers to a religious activity that the gentry held for common people to ward off evil and pray for fortune in the event of natural or man-made calamities, such as drought and insect infestations (Figure 1-4-34).



Figure 1-4-33 Cattle dance at the beginning of spring



Figure 1-4-35 Cattle burial performance



Figure 1-4-34 Gaosheng

**Cattle Burial.** The Hakka in Chongyi sacredly respect cattle and treat them as family members. Families feel grateful for cattle and honour them in death as well. In the busy season, cattle are fed with carefully brewed porridge in addition to traditional grass and straw. After their death, after having their nose ring removed and body washed, they are lifted by strong men up to the hills and buried beside the terraces where they once worked. Then, burial activity is held for them (Figure 1-4-35).

## (2) Value systems of Zhuang and Yao nationalities in Longji Terraces

The residents of the Longji area are mainly Zhuang people and Yao people, with family as the basic social unit and clan and kinship as the basis for social structure. Some village stipulations and conventions have been formed centering on guaranteeing the stable evolution of the Longji Terraces as well as the management and protection of the terraces. Worshiping ceremonies for mountain gods and mountain prohibitions, among others, are used to protect the forest and water sources above the terrace. Taoist and Witch belief refers to the national characteristics belief system which is formed by Zhuang people on the basis of nature worship and ancestor worship and mixed with Buddhism and Taoism, which were introduced by the Han nationality.

As a historical record of about 2,300 years, the Longji Terraces is a sign of the special local



culture. Shared beliefs, thinking patterns and behavior modes are formed through collective activities, memorial ceremonies, festivals and other social conventions, and thus the culture will pass down generation by generation. All the popular ritualistic act of worship today are the outcome of the cultural transmissions. All the historical and cultural memories are integrated into the terrace culture, including the clan conceptions represented by Liao clan and Wei clan, religious beliefs, folk ways and manners, and the local history as well as social values are all engraved in the minds of all ethnic groups, and the social identity and cultural consciousness is thus bred intuitively. On this basis, the local kinship, villages and traditional livelihood centered around rice production are sustainable development.

The ritualistic worship of mountains gods and holy trees and other folk customs, all of those respective behaviors for the nature have deep implication for today's environmental protection (Figure 1-4-36).

Owing to the Village Behavior or Prohibition Tablet shows, the villagers to be thieves are prohibited. And digging bamboo shoot to protect bamboo forests is prohibited as the Bamboo Shoots Digging Prohibition Tablet describes. Moreover, mountain prohibition is the protection of the forest.



Figure 1-4-36 The worshipping rituals of mountains gods and holy trees in Longji Terraces

### (3) Value systems in Ziquejie Terraces

Traditional cultural beliefs in the Ziquejie Terraces reflect characteristics of Wu Nuo witch craft culture, which takes the polytheism as the main feature (Figure 1-4-37). Wu Nuo folk activities expressed the worship of local people to the ancestor named Chiyou. Meanwhile, through the worship of the founder Zhang Wulang and White Goddess that represent the gods of Meishan, local people express their hope and good wishes of achieving harmonious coexistence with the natural environment and maintaining sustainable development.

First of all, Nuo opera (Figure 1-4-38), Nuo dance, Nuo lion mask dance (Figure 1-4-39) are important activities to express worship for Chiyou. Nuo opera, Nuo dance and Nuo lion mask dance are dance forms developed and evolved from primitive ritual activities. The actors performed with props, such as Nuo mask, wood knife, wood gun, dummy, and musical instruments and other props, and dance moves to express people's worship for their ancestors.



**Figure 1-4-37 Nuo Mask**



**Figure 1-4-38 Nuo Drama**



**Figure 1-4-39 Nuo Lion Mask Dance**

Secondly, though the worship for gods of mountains, gods of waters, gods of thunder and other gods, local people express their hopes and good wishes of achieving harmony with the natural environment. For example, local people pray for good weather and abundant harvests in the coming year by inviting Taoist priest at the Lunar New Year day to resort to magic arts, which actually express the people's reverence for the natural environment.

Thirdly, local people shows their worship for gods mastering the production techniques to express their hope for a better life, such as founder Zhang Wulang, who mastered the techniques of hunting and fishing and was able to cut a mountain for cultivating fields; and the White Goddess who was in charge of poultry. These unique beliefs help people to constrain their daily behavior and protect the environment of the terraced fields actively. For example, bounded by beliefs mentioned previously, local people will not cut down trees on the upper terraced fields and will not destroy the mountains in the upper areas for farming purposes as well. Traditional beliefs are of great importance to maintain the sustainable development of the terraced fields.

## **(4) Value systems in Lianhe Terraces**

In a long historical period, the people in Lianhe terrace area created their own value system such as worship, taboos, etc. which restrained local people from destroyed the whole terraced system, and formed stable social organizations which guided them through production and life according to their special norms such as village regulation and agreement, mutual aid and cooperation.

### **1) Worship**

People in Youxi think that the Jade Emperor is sovereign, so they hold ceremonies to worship the Jade Emperor in case of important happy events such as wedding, birth of babies, birthday parties and house moving (Figure 1-4-40).

Worship the Chan master subduing the tiger (Figure 1-4-41). The Tiger Subduing Temple Fair has been in existence since the Southern Song Dynasty. The ceremony is very grand. The main reason is that Youxi was troubled by tigers in the Song Dynasty. The Chan master subduing the tiger is the god who subdues tigers in people's mind. He solves troubles caused by tigers.



Figure 1-4-40 Worshipping the Jade Emperor



Figure 1-4-41 Tiger Subduing Temple Fair

## 2) Taboo

“Spring Sent by the God” falls on the 9<sup>th</sup> day of the first lunar month. There are many taboos on this day. People rise up and wash the face. The face-washing water can’t be poured into the ditch and pitch for fear that it may stain the Jade Emperor’s face. On this day, people are not allowed to sweep outdoor places; rubbish in the house can’t be dumped outside. Kids are not allowed to urinate in outdoor places; otherwise it’s an offense for the Jade Emperor. Women’s underpants can’t be aired in open air to avoid contradiction between yin and yang. Peasants are not allowed to carry night-soil buckets or wash buckets by the pool for fear that it may offend the Jade Emperor and gods.

On the 1<sup>st</sup> day and 15<sup>th</sup> day of each lunar month and the 24<sup>th</sup> day of the fifth lunar month, people are not allowed to carry urine buckets. Particularly, on the eve of the 24<sup>th</sup> day of the fifth lunar month, the clan leader and the night watchman beat gongs to notify people, “tomorrow is the 24<sup>th</sup> day of the fifth lunar month. Don’t carry urine buckets lest blasphemy”.

The 10<sup>th</sup> day of the first lunar month is the “birthday of ground”. On this day, people shouldn’t break or dig in ground. The 8<sup>th</sup> day of the fourth lunar month is the “Farm Cattle Festival”, and people shouldn’t let cattle work. Weeding is not allowed on the Beginning of Autumn Day. Mantis eradicating is not allowed on the Limit of Heat Day. It means there should be no delay in the farming season.

Timberjacks should keep silence before lumbering on the mountain. The timberjack cuts a gap on the tree head and begins to fell its upper parts.

### 1.4.3 Social organizations

#### (1) Hakka clan system

Thanks to the complete clan system in the Hakka culture, a large scale of reclamation is conducted on the local terraces. In this process, the social relationship maintained by clans is also strengthened. The Hakka in Chongyi are simple and honest, diligent and helpful. They help each other in labor and manage the terraces together.

Rice planting on terraces is typically labour-intensive entailing a large water demand and complicated procedures from nurturing seedlings to harvesting. The clan can gather strength to acquire as many resources as possible and expand the space for existence to the utmost. With the ancestral hall as the center (Figure 1-4-42), clans in Chongyi are led by their chiefs, communicate internally and participate in terrace construction and cultivation as groups. Moral codes and rules of conduct, such as the clan rules and family rules, are followed to constrain and educate clan members and organize production in a united way. The clan management guarantees the stable and



Figure 1-4-42 An ancestral hall of the Hakka in Chongyi

normal expansion of terraces, which ensures the harvest and agricultural development, paves the way for population growth and thus makes the clan expand. Due to the terrace production, the Hakka clan society survives and multiplies in the mountains, and become more entrenched than that in other areas.

## (2) Social organizations in Longji Terraces

The People in Longji Terraces are simple and sincere. They enjoy a harmonious life with all ethnic groups. The labor exchange system is still maintained in Longji Terraces. For example, if any family is short of hands in building or renovating a house, fellow villagers will volunteer to help. A turn-taking help is equal to every villagers, regardless of pays, but only a dinner.

The term "recognize old geng (age) " refers to a non-blood social connection between two people of similar age and similar interests, and these people always help each other. This system has strengthened the exchanges and cooperation between the villagers, and has promoted social harmony.

In the water resources management, people make decisions mainly from the following two aspects: 1) From the “Following the Order of the Oldest” system, also known as patriarchal system, which is an organization that enable the villages to discuss affairs and unified actions together. The patriarchal system (Figure 1-4-43) of each village make joint efforts to affairs including water resources distribution and environmental protection. In terms of water resources, the water distribution is mainly depends on the size of the field and the contribution of digging the ditches; 2) it is from some rural regulations and laws on water management and maintenance, such as stealing the water in the fields of others, digging the water source secretly, and everyone has the right to criticize and stop it, there are also some punitive measures.



Figure 1-4-43 The patriarchal system in Longji Terraces



### **(3) Social organizations in Ziquejie Terraces**

Individual unit area of the Ziquejie terraces is relatively small. Cultivation is mainly cultivated by manpower and a kind of traditional labor-intensive agricultural production. Therefore, a working partnership featured with mutual assistance and cooperation between local farmers is formed. To be specific, in the busy season, it is difficult for labor force in one household to complete the big amount of farming work in terraced fields in time. , Therefore, local farmers cooperate and help each other by the way of “exchange labor”, “labor repay”, “labor switch”, “casual labor”, “labor assistance” and others. As a typical mutual cooperation model between labors, this labor relationship not only solves the temporary labor shortage problem during agricultural production, but also helps to achieve a harmonious coexistence between neighbors. Thus, this labor relationship has a positive reference for the communication and association within the neighborhood and the community now and in the future.

In the Ziquejie Terraces, there are village rules and regulations about forest conservation, water distribution and management, and water engineering maintenance. They are inherited from generation to generation and followed by all the villagers. Generally, there are some persons to watch the water in the terraced fields. Each person will take in charge of 20-30 mu terraced fields, and checked them once every two days.

### **(4) Social Organizations in Lianhe Terraces**

#### **1) Village Regulation and Agreement**

Farm work in terraces in Youxi is based on manpower and animal power. Particularly, people carry rice in the field home during the autumn harvest; the road is public. Therefore, villages agree on a Road Repairing Day before the autumn harvest. They remove sundries on both sides of the road and fill grooves on the road so that the road becomes flat when people carry grains home.

Water is the most important factor for agricultural production, repairing the ditch system using for irrigation and drainage is another important content in village regulation and agreement. According to the agreement, all the households must take part in ditch construction and repairs in each year. Generally, in spring and winter, villager teams organize villagers to voluntarily build and desilt channels and weed to ensure the availability of agricultural water. Villagers obey the plan and distribution of production water by the village head.

There are many village regulations promoting villager unity and harmony. Each village in Lianhe terraces usually develops the spirit of mutual accommodation and prevents disputes and fights. The team organizes villagers to clean the areas around their houses and main streets of the village on the 24<sup>th</sup> day of the fifth lunar month every year.

#### **2) Mutual aid and cooperation**

**Farm cattle sharing:** In Youxi County, it is very small in farmland area each family has due to a few farmlands for the large population. The farmland area per capita is less than 0.067 ha. The farm

cattle will be unused for a long time if every family raises a head of farm cattle. And raising cattle is expensive and time-consuming. Therefore, it is common that several families raise a head of cattle together to reduce the cost and make the best use of animal power in Lianhe terrace.

**Mutual help with farm work:** Terraced fields are small and steep and need intensive labor. It's difficult for one family to finish reaping by themselves within the best harvest time during harvest seasons. The tradition of mutual help can solve this problem through use effectively labor force in different families. It is because the time of seedling transplanting and ripening of crops is different in different altitudes. When one family begins to transplant seedlings or reap but other families do still not begin to transplant or harvest, other families will help the family to do farm work, vice versa. The mutual help tradition ensures the normal operation of farm work in terraces, harmonious relationships among people and the stability of the terrace system.

## 1.5 Remarkable landscapes, land and water resources management features

### 1.5.1 Landscape structure and Land-use features

After the long evolution of the local people with the environment, the four rice terraces have formed a remarkable vertical landscape that is comprised of four key elements that are forests, terraced fields, villages and rivers from the top of the mountain to the bottom.

#### (1) Landscape and land-use in Hakka Terraces

The area of terraced fields accounts for more than 60% of arable land in core area of Chongyi Hakka Terraces. In the Shangbao Township, 94.5% of farmland is terraced.

##### 1) Landscape pattern of Hakka Terraces

The main groups of terraces in core area are up to 62 layers, with the highest altitude of 1260 m and the lowest of 280 m. The gradient is mainly reflected in the slope at 40°-70°, and named as the steep terraces (The left and middle in [Figure 1-5-1](#)). Terraces fields are mostly broken plots only cultivated with 1-2 row rice. It looks like “Daiziqiu” and “frog hops three fields” due to the high gradient (The right in [Figure 1-5-1](#)). The landscape pattern highlights the function of expanding cultivated area of terraces and improves the land utilization value. And it also has high ecological and aesthetic values.



Figure 1-5-1 Steep terraces (left and middle) and “Daiziqiu” broken plots (right)

##### 2) Various elements of Landuse in Hakka Terraces

Dense forest, bamboo, cascading terraces, the botanical garden and rich decorative style of the Hakka houses combine together to form the distinctive terrace landscape, and shows great diversity of local landscapes. According to the altitudes from high to low, the landscape elements are forest,

bamboo forest, tea garden, terrace (with residences), orchard, river (Figure 1-5-2). Together all landscape elements suggest that the Hakkas have living wisdom to adapt to the local natural environment, and the skill of optimizing local landscape patterns and its functions (Figure 1-5-3).

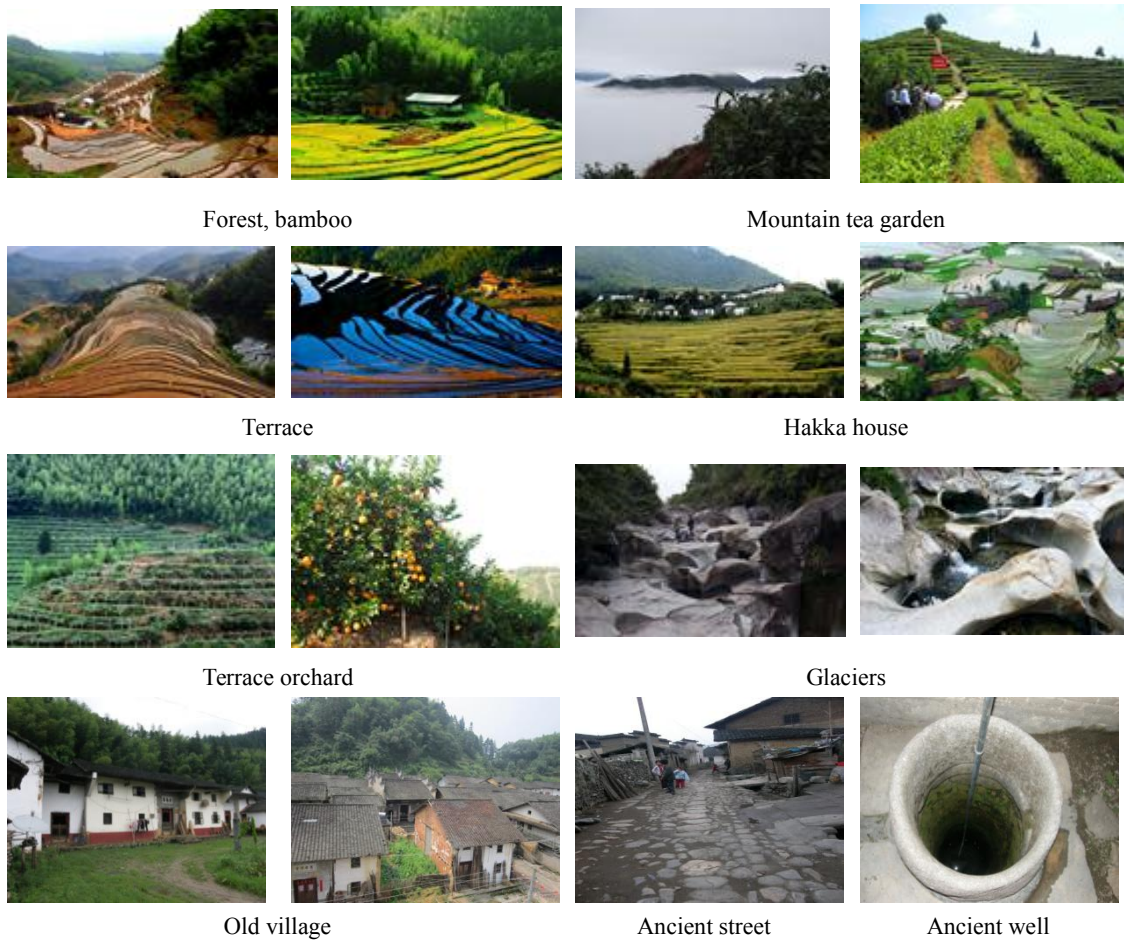


Figure 1-5-2 Various landscape elements in Chongyi Hakka Terraces

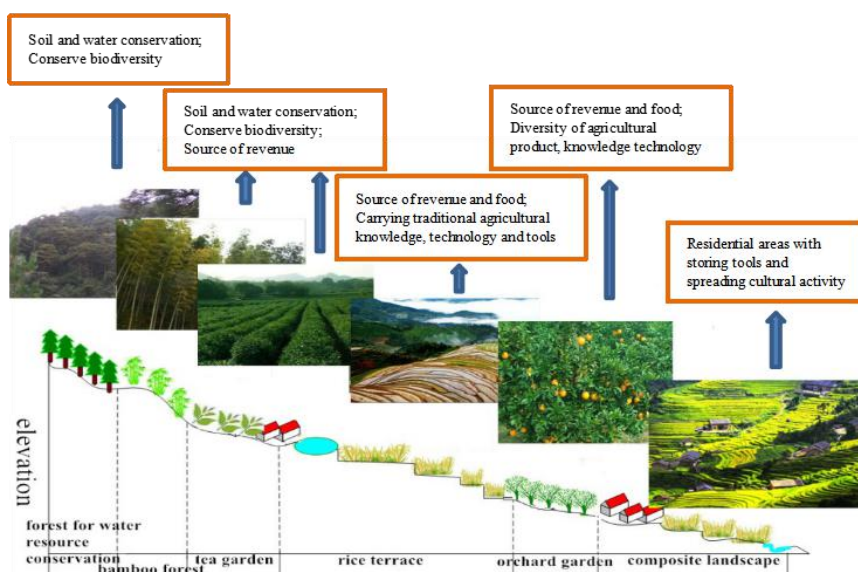


Figure 1-5-3 Landscape pattern profile of Chongyi Hakka Terraces

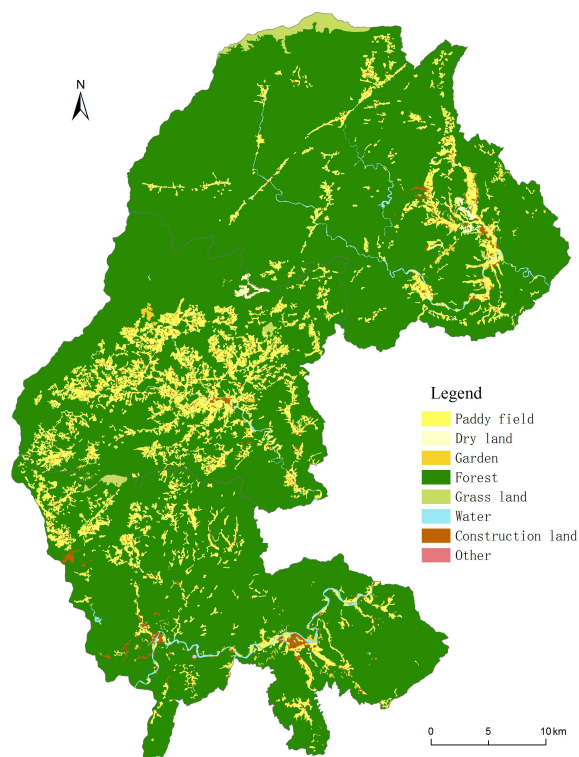


The landscape elements function together as a system (Figure 1-5-3). Grassland and forest (include bamboo forest) plays an important role in soil and water conservation and biodiversity conservation. Paddy fields and dryland (such as tea garden and orchard) provide abundant primary products and they also have the function of biodiversity conservaton and microclimate regulation as same as grassland and forest. All these elements together build the landscape of the terrace system and support the sustainable development of the terrace system ecologically.

In the proposed site, forest makes up the largest part of all landuse types, which area is 45541.12 ha, accounting for 87.39% of the total area. The area of paddy field and Dryland is 4694.21 ha, accounting 9%. The areas of Garden land and Grass land are 229.17 ha and 443.62 ha, respectively (Table 1-5-1, Figure 1-5-4).

**Table 1-5-1 Type and area of Landuse in Chongyi Hakka Terraces**

Landuse Type		Area (ha)
Cultivated land	Paddy field	4,440.17
	Dry land	254.04
Garden		229.17
Forest		45,541.12
Grass land		443.62
Water		436.72
Construction land		768.65
Other		1.03
Sum		52,114.52



**Figure 1-5-4 Land use pattern in Chongyi Hakka Terraces**

## (2) Landscape and land-use in Longji Terraces

### 1) Landscape structure and landuse

Longji Terraces system has the highest attitude of 1,916 m and the lowest attitude of 300 m with the gradient difference up to 50 degrees. In the exploitation of land resources, Zhuang, Yao and other peoples, out of adequate consideration of the natural geographical conditions, have treated the mountains into three sections: forests on the mountain top, villages on the mountain side and terraced fields on the sides of villages and at the foot of the mountains. The high ranges between the elevation areas of 1,100 m-1,916 m are forest zones, and below the zone, the evergreen forest vegetation such as arbors, bushes and grasses are distributed in the vertical climate formed at different elevations and following the various contours of the mountains. The terraced fields are distributed between the elevation areas of 350 m-1,100 m, making up an artificial ecosystem with terraced fields embraced by forests, which is significant to the water and soil conservation and soil improvement (Figure 1-5-5).



**Figure 1-5-5 Various landscapes in Longji terraces**

The total area of Longji Terraces is about 23770 ha, of which forest accounted for 67.6%, arable land accounted for 18.1%, garden land accounted for 0.7%, grassland accounted for 10.4% (Table 1-5-2, Figure 1-5-6).

**Table 1-5-2 Type and area of Landuse in Longji Terraces**

Landuse Type	Area (ha)
Paddy field	1360
Dry land	2,942.37
Garden land	166.39
Forest	1,6068.52
Grass land	2427.86
Construction land	283.51

Water	499.14
Other land	22.21
Sum	23,770

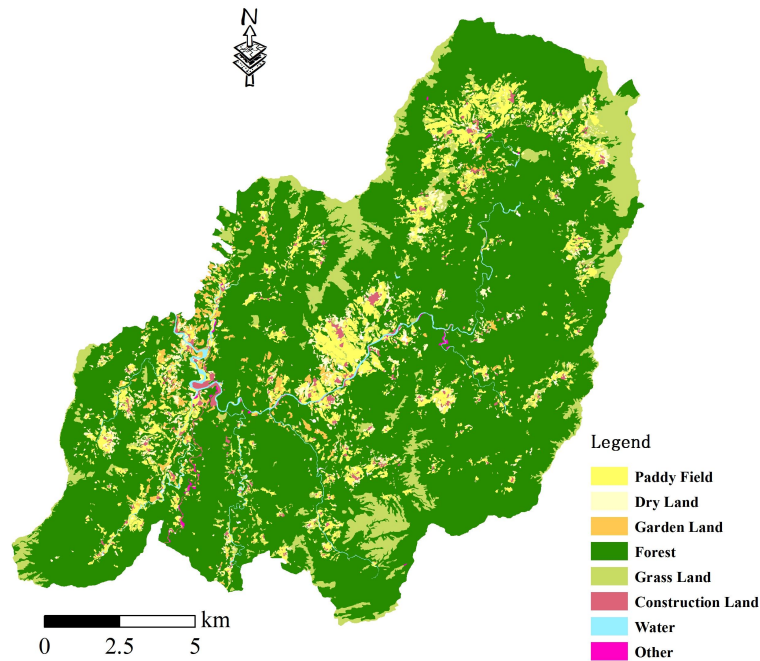


Figure 1-5-6 Land use in Longji Terraces

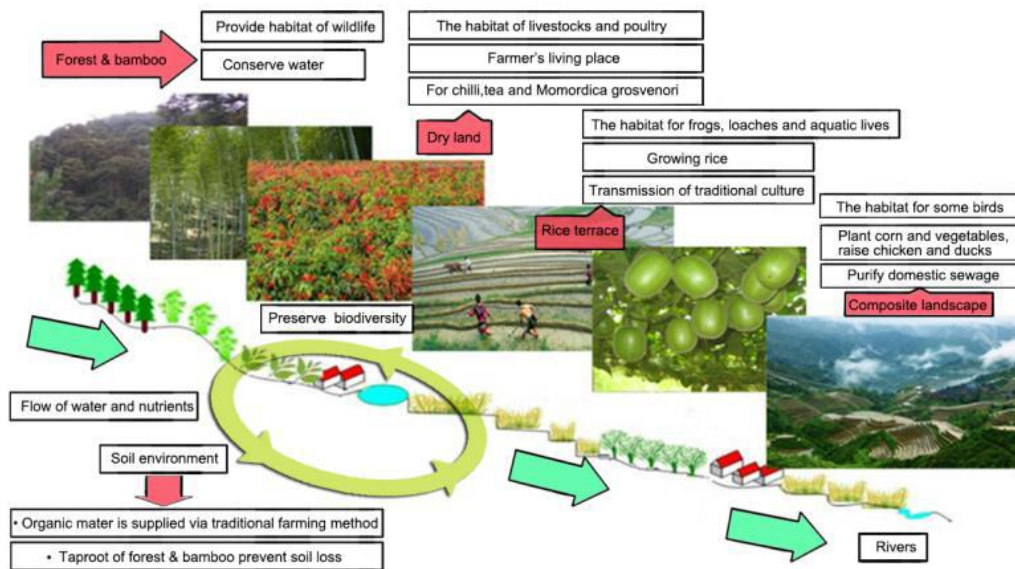


Figure 1-5-7 The diagram of ecological functions in Longji Terraces

Each landuse type interacts with each other and functions as a whole system (Figure 1-5-7). Forest and bamboo grove on the top of the mountain can conserve water and prevent soil erosion, which is important for rice and other crops, vegetables and orchards planted below the forest. They can also provide habitat for wildlife, therefore important for biodiversity conservatoin. Paddy fields and dryland

also play an important role in biodiversity conservation, soil and water conservation and environment purification. Composite landscape at the foot of mountain can purify sewages flowing along the mountain and also provide the habitat for animals like some birds which eat pests. Different landuse types have formed an organic, integral system that plays an important role in ecological conservation.

## 2) Features of Forests

The forest coverage rate in Longji Terraces is up to 79.1%. Under the influence of micro-climate and different soil and water environments caused by elevation and land form, the vegetation types in the mountains are diversified, displaying an organic agglomeration of over 1,000 plants such as arbors, bushes, grasses, ferns and mosses, and constituting a perfect forest vegetation system and a complete forest ecosystem. The forests above the attitude of 1,700 m feature the subtropical deciduous broad-leaved mixed forests; at the attitudes of 1,300-1,700 m, broad-leaved trees in the families of Fagaceae, Magnoliaceae, Lauraceae and Ericaceae, forming a mid-subtropical mountain deciduous broad-leaved mixed forests; at the attitudes of 800-1,300 m, broad-leaved trees as primary, and economic forests of pines and Chinese firs as secondary; at the attitudes of 300-800 m, Chinese firs, masson pines, tea-oil trees, tung trees, moso bamboo, and various broad-leaved trees.

## 3) Features of terraced fields

On the Longji Ridges, where there are streams, there are terraced fields of various shapes and sizes, most of them are narrow, big but one acre, some tiny rice fields are even smaller than a raincoat. The long, coiling terrace lines crawling from the mountain foot up to the mountain top and the tremendous momentum are created by the highest attitude of 1,180 m, the lowest attitude of 380 m, sharp, vertical drop of 800 m, and an area of 1,174 ha, make the Longji Terraces one the best scenery and outperform all the other terraced fields in the world. In the longitudinal directions of slopes, terraced layers ascend step by step; in the horizontal directions, each patch of paddy fields shows off its natural contour lines following the shape of the mountains. Those long curves and squiggles loos as if colored silken bands are dropping from the shy. Gold-Pit Terraces are also well-known for their animated imageries, small hills with terraces wound around them looking like sea snails, big mountains with terraces circling around them resemble pagodas, series of connected terraces patches remind us of animal patterns--eagles spreading their wings, nine dragons playing with beads, hundreds of animals paying homage to the phoenix, etc. Some look as if seven planets revolve around the sun, some are typical terrace shapes, and a few have special-shaped ridges just like laces on our cloths (Figure 1-5-8).



Distance view



Ridges

**Figure 1-5-8 Terraces landscapes in Longji Terraces**



## 4) Characteristics of villages

The first people of the Longji chose the groove-like grounds on mountain sides as the site of villages, with the convenience for both daily life and productions such as daily water supply, mild climate impact with ventilation but not too big and humidity proper, and occupation not cramming into the terraced fields. The architecture is mostly Ganlan residence, made up of wood and stone, housing spacing is small, the overhead, no pillars of the foundation, only in the bottom of the column set stone pillars, cover a small area, strong adaptability to the local natural environment. It's usually divided into three layers, the first layer is relatively short, not to live, to captive animals, store tools, etc., the second layer is a place for people live, storey height is higher, the third layer is an attic for storing food and sundry, but there are also differences in the Ganlan residence between the various ethnic groups (Figure 1-5-5).

## (3) Landscape and land-use in Ziquejie Terraces

### 1) Landscape pattern of Ziquejie Terraces

Based on its topography, geomorphology, ecological environment and traditional buildings, a harmonious landscape of the four elements, namely the forests, terraced fields, folk houses, and rivers, is formed in the Ziquejie Terraces (Figure 1-5-9).

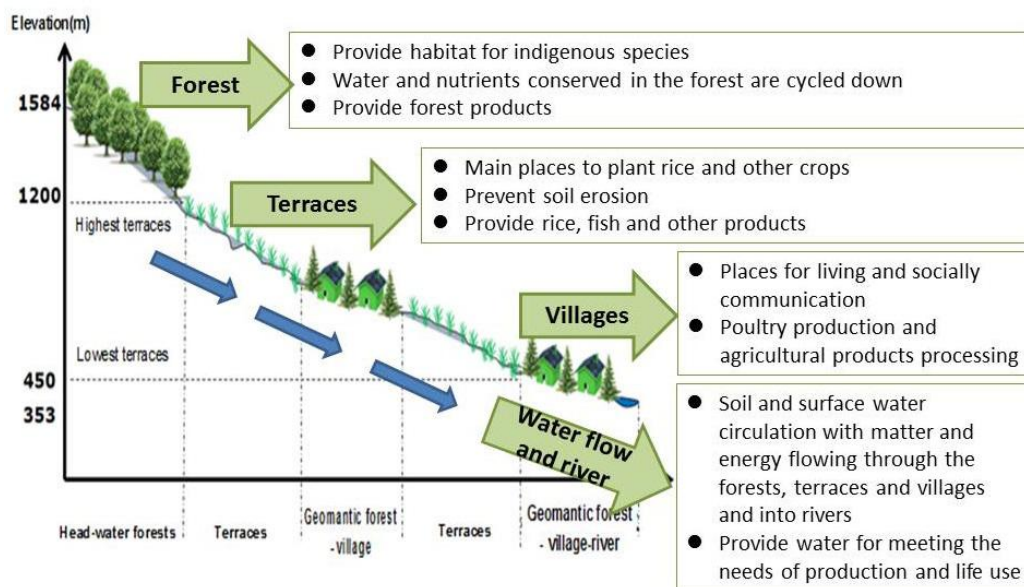


Figure 1-5-9 Vertical Landscape of the Ziquejie Terraces

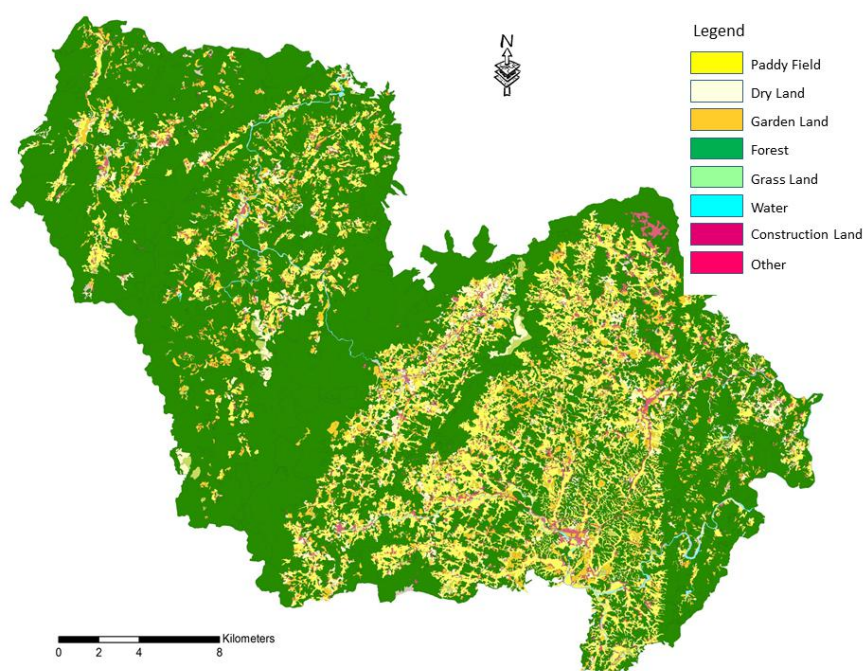
Forests on the top of the mountain play an important role in water conservation and regulation with its huge root system. Soil water and surface water flow through the forests, terraced fields and villages then into rivers, and meet the needs of agricultural production and residential use, even in dry seasons. Water flows communicate the circulation of matter and energy of the terrace system. In addition forests also provide habitat for indigenous species, thus important for biodiversity

conservation. Paddy fields and dryland provide abundant food for residents and also has the function of preventing soil erosion. Grassland is scattered in the terrace system, but it is also very important for soil and water conservation.

The land is mainly dominated by forest and farming land. Forest in Ziquejie Terraces is about 30490.8 ha, accounting for 68.3% of the total area, while paddy fields in the core area is about 6089.3 ha, accounting for 13.6% of the total area. (Figure 1-5-10).

**Table 1-5-3 Type and area of Landuse in Ziquejie Terraces**

Landuse Type		Area (ha)
Cultivated land	Paddy field	6,089.3
	Dry land	1,491.0
Garden		2,546.7
Forest		30,490.8
Grass land		320.5
Water		477.6
Construction land		1,897.7
Other		1,347.5
Sum		44661.0



**Figure 1-5-10 Land use pattern in Ziquejie Terraces**

## 2) Features of Forests

Covered by dense forests, the Ziquejie Terraces are rich in a variety of plants (Figure 1-5-11). Forests in this region are mainly formed by cedar forests, chestnut forests and bamboo forests, mixed in a variety of shrubs featured with herbal plants, mainly ferns. Generally, the forest in the Ziquejie

Terraces has four layers from high to low. The first layer mainly includes pine, cypress, maple, and other trees. The second layer includes camellia, bauhinia and other shrubs. The third layer mainly includes fern and fallen leaves. The fourth layer is mainly the root of trees and grass.



**Figure 1-5-11 Dense forests in the Ziquejie Terraces**

### 3) Features of terraced fields

There are more than 500 levels of terraced fields in the Ziquejie terraces. Most of them are located at an altitude of 500-1,000 meters with the highest elevation of 1,200 meters and the lowest elevation of 450 meters. Slope of the terraces is between 25°-40°, with the deepest slope of 50°.

The total area of terraced paddy fields in Ziquejie Terraces is about 80,000 mu, of which the most concentrated pieces are more than 20,000 mu. The largest single piece of terraced field is less than 1 mu while the smallest can only be inserted with dozens of seedlings. The five representative concentrated terraced fields are Longpu, Shifeng, Changshi, Baishui and Jinlong, while different landscape features are shown in different fields. For example, the Yajizha terraces within Changshi stretches along the hillside for a long distance and is of grand scale; the Baguachong terraces in Shifeng wanders through the valleys and shows a magnificent varied scenery with the Eight Diagrams pattern in it; Laozhuang terraces in Jinlong is gently surrounding hills near the village and forms a unique landscape showing the harmony between natural and human by integrating the simple structured folk houses and the terraced fields with lively lines (Figure 1-5-12).



Yajizhai Terraces



Laozhuang Terraces



Baguachong Terraces

**Figure 1-5-12 Representative concentrated terraced fields in Ziquejie Terraces**



#### 4) Features of villages

The formation of villages in the Ziquejie Terraces is closely related to the evolution of terraced fields. Traditional ganlan-style folk houses and geomantic forests are interspersed between layers of terraced fields. These scattered folk houses make it convenient for local farmers to work in the nearby fields and use water, reflecting the settlement principle that “the best settlement place should be near by the mountains and rivers, and also adapt to local conditions”. Plank folk houses with simple structure and the terraced fields with majestic landscape are silhouetted against each other while squared and painted white window panes and the pastoral scenery perfectly complement each other (Figure 1-5-13).



Figure 1-5-13 Folk Houses in Changshi Village of Ziquejie Terraces

#### (4) Landscape and land-use in Lianhe Terraces

Youxi people created a scientific and beautiful landscape system which is comprised of four elements like forests, villages and ponds, terraces and or rivers. The Lianhe Terraces system is usually reclaimed on mountain slopes, which distributes between 300 and 900 m. The forest for water resource conservation and bamboo forest for building and weaving are on the mountain top; villages, ponds and terraces are on the middle part of the mountain and villages scatter among terraces; rivers are on the lower part. A spatial framework of forest for water resource-bamboo forest-village-terrace-combination of terraces and villages - river conservation is thus formed from top to bottom (Figure 1-5-14).

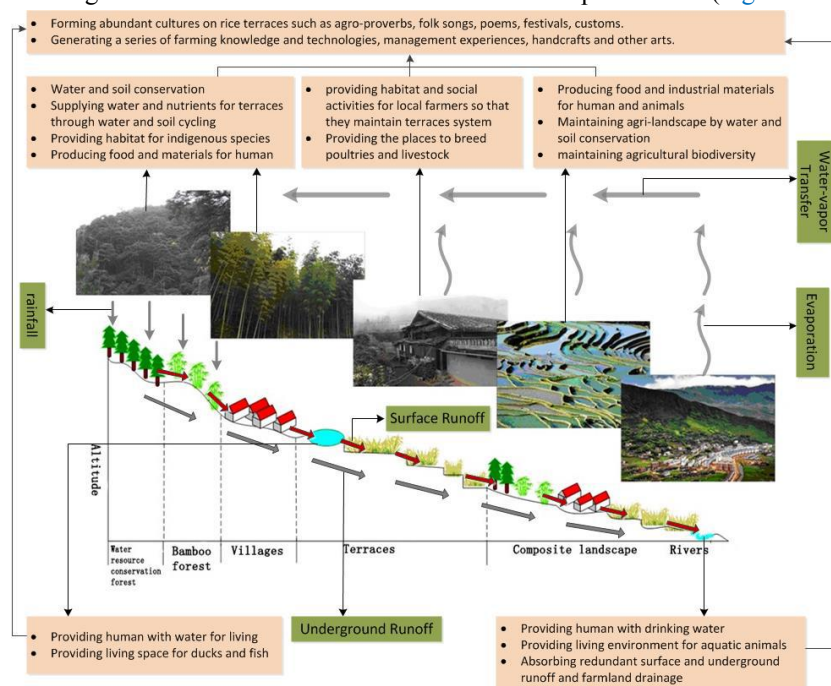


Figure 1-5-14 Vertical Layout of Lianhe Terraces



This structure has many advantages. Forests on the top of mountains can conserve water and provide continuously local people with living and production water. Being in the middle of mountains, the villages have lots of benefits such as moderate temperature in summer, convenience for work due to closing to terraces and forests. That terraces are in the foot of mountains can get more heat of benefiting crop growth.

This landscape structure is also advantageous from the perspective of ecological supporting. Forests play a crucial role in water and soil conservation, so they can supply water and nutrients for terraces through surface and underground runoff. They also provide habitat for indigenous species and food and materials for human. The main function of grassland includes preventing soil erosion and conserving biodiversity. Paddy fields, besides producing food and materials for human, also function ecologically such as water and soil conservation, nutrient retention, and biodiversity conservation. Dryland including tea gardens are also important places of food production, and they also play a role in biodiversity conservation and water and soil conservation.

Lianhe Terraces are known as its narrow width and small field area. The fields are described small as a bamboo hat or an eyebrow. There is a proverb that frog can over three patches of field in a jump. So many terraces like ribbons from the foot to the top of mountains form a very beautiful landscape. The landscapes have an extremely high tourism value

In the vertical layout of Lianhe Terraces, different landscapes are well-spaced with clear boundaries. The layout reflects the harmonious environment in which fields and forests are combined and terraces and villages are combined and shows a rich and diverse spatial layout for landscapes (Figure 1-5-15).



Figure 1-5-15 Villages in Lianhe Terraces

Vertical variation of plant landscape is very obvious. The landscape consisting of crops in Lianhe terrace is mainly differentiated based on different altitudes. The crop rotation pattern “vegetable – rice - winter fallow (or green manure)” is in below 400m. The crop rotation pattern “middle-season rice - oilseed rape rotation or paddy-vegetables (vegetables, watermelon, corn, peanut, soybean, green soy bean, pea, tobacco, mushroom, green soy bean, pea, etc)” is between 400-600m. The crop rotation patterns “areas middle-season rice- vegetables (mushroom, potato, green soy bean, pea)”, “middle-season rice - winter fallow (or green manure)” and “late rice of single season- winter fallow (green manure)” are above 600 m.

In the proposed site, the wood land covers the most part of the total gross land, which accounts for 68.4% of the gross land area (Figure 1-5-16). The cultivated land is small, just constituting 18.0% of the total land area. Other land use patterns are very small, and each of them is not more than 5% of the total land area.

Table 1-5-4 Type and area of Landuse in Youxi Lianhe Terraces

Landuse Type	Area (ha)	
Cultivated land	Paddy fields	1662.4
	Dry land	198.0
Garden	470.2	
Forest	7083.2	
Grass land	354.4	
Water	70.5	

Construction land	424.3
Other	55.0
Sum	10318.1

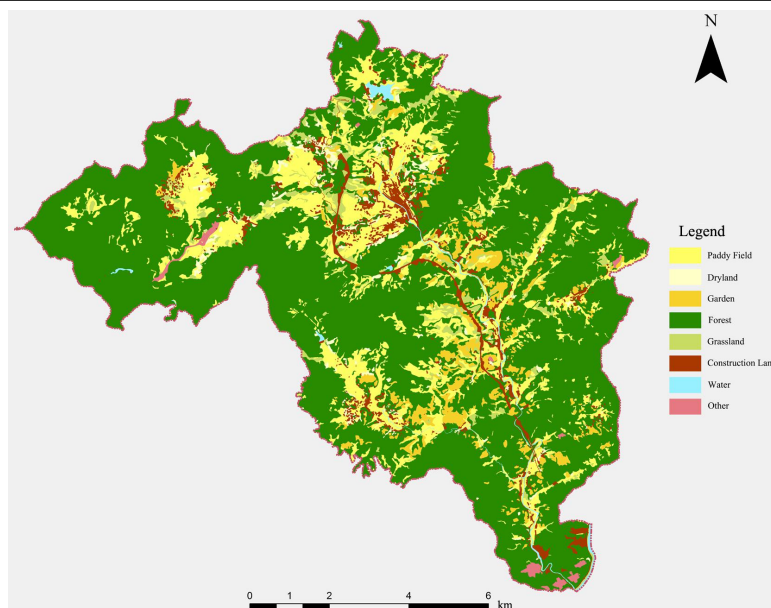


Figure 1-5-16 Land use pattern in Lianhe Terraces

## 1.5.2 Water resources management features

The water resources management in the four rice terraces reflect the wisdom of the local people to the largest degree. First, the local people attached great importance to the protection of the forest on the top of the mountains. The forest can intercept rainfall, reduce runoff loss and slow down the water flow, therefore continuously providing the terraced fields with water. Second, the local people ingeniously created the natural gravity irrigation system. The system is mainly comprised of water storage projects, irrigation and drainage canal system and control devices, which has not only formed a unique landscape of irrigation project but also played a very important role in irrigation and drainage in the terraced fields. Finally, the forest and the irrigation system are strictly protected and effectively managed by the local people. In Hakka and Longji Terraces, the management is carried out by the clansman through the patriarchal system. In Ziquejie and Lianhe Terraces the management is realized through the village rules.

### (1) Water management in Hakka Terraces

#### 1) The forest protected strictly by managers

The Hakkas attach great importance to the protection of forests above the top terraces. In the period private ownership of forests, traditionally, farmers have taken an effective management of the forest. Forests manager protected timber from cutting strictly. If the people from outside want to cut fuel wood in the forests on top of the terraces, they must get the managers' approval. The mountains, villages and

irrigation are managed strictly by the clansman, which makes the top of the terraced mountain forests develop into a large “reservoir” to ensure adequate water for the rice planting. After the construction of terraces, the ridges are easily affected by storm runoff, rat pest piercing and livestock trampling, so the terrace ridge should always be checked and trimmed.

## 2) Various irrigation methods

Terraces take the water seepage on the hillside as a source of irrigation, with building canals to guide the rain and the spring water into farmland. Field irrigation generally adopts the artesian irrigation method (Figure 1-5-17), and can reasonably allocate water resources. When the fields are higher than the water level, the Hakas generally use the waterwheel to raise water (Figure 1-5-18).



Figure 1-5-17 The artesian irrigation method Figure 1-5-18 The waterwheel still being used in Gaoche village

Because of the plentiful rainfall in Chongyi Hakka Terraces most of years, there are less drought conditions in this region, especially with the well construction and conservation of water irrigation facilities. And some fields retain the traditional technology of storing water to protect the ridge from collapsing in winter, which keep the drought disaster away from most of terraces fields.

## (2) Water management in Longji Terraces

The current water sloping is reasonable, neither washing too much nor depositing too much; the flow rate is also proper. On the remote mountain top, the elevated water pipeline made of linked moso-bamboos with the membranes between the internodal regions removed is to deliver water. At the foot of the mountain, water carts and water-powered trip-hammers are built with craftsmanship, and, with the power of water, they are used to process grains into clean, fine flours or rice, for convenient human consumption. Diversion canal is built at the sides of ridges, and the canal flow has the division of main canal and branch canal. Mountain spring water and natural precipitation are restored or introduced to the canal, and the canal water flows to the terraces. And local villagers use Woody amaranth, Special bamboo tube and Water segregator vessel to distribute water (Figure 1-5-19).

In the slopes with lines orderly as well as rich in varieties, from the river valleys to the clouds-curling up mountains, from the sides of luxuriantly green forests to the rocky cliffs. The vegetation on both sides of the terraced fields are well conserved, and the evergreen forest vegetation such as arbors, bushes and grasses are distributed in the vertical climate formed at different elevations and following the various contours of the mountains, making up an artificial eco-system with terraced fields embraced by forests. Forests can conserve the water source, counteract the flood peak, extend the

water supply time and quantity (release the drought).

In the aspect of water resources management (Figure 1-5-20), Longji Terraces mainly imposes certain punitive measures on the destruction of water resources by exercising the water use behavior of the locals and protecting the water resources by playing the role of the patriarchal system and the local government regulations. In addition to Ping'an Zhai Yulan Reservoir, there are forest water, alpine swamps, alpine spring water, waterfalls and rivers that are also important reservoirs, some of alpine swamps locating in the highest elevation of the mountain, such as Shitoulong spring which is the highest in the Longji area .

Owing to the ancient building constructed by wood , some villages have built firefighting tanks and filled with water for fire-fighting, such as the "Taiping Qinggang", which is the oldest fire pool in Liao's village.

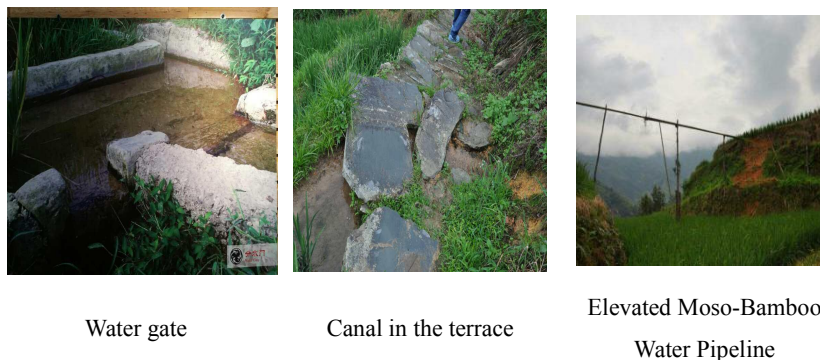


Figure 1-5-20 Water management in Longji terraces

### (3) Natural gravity irrigation system in Ziquejie Terraces

Ancestors of the Ziquejie Terraces built these terraces according to local topography, geology, soil, vegetation and water resource features. They also created the effective natural gravity irrigation system with simple engineering facilities, which form a unique landscape of irrigation project in paddy fields. The natural gravity irrigation system was selected as one of the first batch of World Heritage Irrigation Structure by International Commission on Irrigation and Drainage (ICID) in 2014. The irrigation and drainage system at Ziquejie is made up by three parts: water storage project, irrigation and drainage canal system, and control devices.

#### 1) Water storage project

The top of mountains in the Ziquejie Terraces are covered by dense forests, which provide good conditions for the retention of rain and water. Local mountains were built with granite that featured with solid bottom and less fractures, which served as the water-proof bottom of this invisible reservoir. In addition, the soil on top of the granite is sandy loam that can absorb rainfall very well, and then exudate water evenly, thus helps to form the excellent water conservation system. The good vegetation, sandy loam with good water absorption, the impermeable layer of granite, together with the willingness and tradition of local farmers to protect the forest ensure the high water conservation capacity of the Ziquejie Terraces.



At the same time, many small weirs were built above streams by the ancestors to intercept and diverse the water (Figure 1-5-21). Those weirs were about 1 meter in height and about 2 to 3 meters in length. They were built at different altitudes according to the water supply needs of terraced fields. Grit chambers and flushing sluices are built behind the weirs to reduce canal silting. According to the status quo, there are 69 weirs in this region. In normal times, these weirs ensure water supply for the terraces; during torrential rains, the flood water can overflow and drain away from the top of the weirs. The terrace fields are the major water retaining works. Coupled with the abundant water retained within the soil, the water-retaining terrace fields provide adequate water supply for the terrace agriculture.



**Figure 1-5-21 Grit chamber at the beginning of canals**

## **2) Irrigation and drainage canal system**

The long and narrow field blocks serve as the major canals (Figure 1-5-22). Delivering water through field blocks can meet the irrigation demand of most terrace fields. For some fields, short canals are needed to divert water from small reservoirs or other field blocks. These short canals are usually built along the edges of the field blocks and separated from the field by low ridges. Small irrigation unit means small canal section and discharge; therefore, these short canals are called “hair canals” by the local people (Figure 1-5-23). When delivering water to the platform fields on independent hills, local people set up bamboo tubes as aqueducts (Figure 1-5-24). Bamboo tubes are also employed for trans-altitude water delivery to avoid erosion of the ridges.



**Figure 1-5-22 Irrigation system through Terraced Fields    Figure 1-5-23 “Hair canals” in Terraced Fields**



**Figure 1-5-24 Bamboo Aqueduct**

The natural gravity irrigation system of the Ziquejie Terraces (Figure 1-5-25), together with traditional cultivation methods, water conservation and retention, forest protection, water management, and the other village rules and regulations, has formed a highly effective soil and water management system to realize the gravity irrigation and soil conservation in the Ziquejie Terraces, which becomes very spectacular landscapes. Especially, in order to protect the water conservation function of the terraced paddy fields, enough water is kept in the terraced paddy fields even in winter to prevent the soil of the ridges from mud crack that might in turn damage the water conservation and retention. This practice has formed a unique landscape in winter (Figure 1-5-26).



**Figure 1-5-25 Natural Gravity Irrigation System** **Figure 1-5-26 Water Conservation in winter**

### 3) Control devices

From generation to generation, local farmers in the Ziquejie Terraces are consciously abide by some of the village rules and regulations related to water distribution management and water engineering maintenance in terraced fields. For example, water resource at higher places shall be used for irrigation of terraced fields with higher altitude while water resource at lower places shall be used for irrigation of terraced fields with lower altitude (Figure 1-5-27). As a rule, water from a higher level of channel is used to irrigate terraced fields in higher places. The number and location of terraced fields to be irrigated by each channel is regulated beforehand. With simple control and regulation facilities, like water distribution recorded by carved wood or rock (Figure 1-5-28), effective water management can be realized.



**Figure 1-5-27 Water Distribution in Terraced Fields** **Figure 1-5-28 Water Distribution Recorded by Carved Rock**

As a full-fledged gravity irrigation project built with simple technology and natural materials, Ziquejie Terraces are perfectly adapted to local conditions and have provided local farming system with water guarantee for more than 1000 years.

#### **(4) Water management in Lianhe Terraces**

Lianhe Terraces as a vertical landscape system has the function of regulating water resource. Youxi ancestors created the landscape “forests and bamboos-villages and ponds-terraces-rivers” is a very scientific gravity irrigation system and enjoys the function of self-regulating management for water resource. Firstly, there is rich rainfall in Youxi County, for example, the rainy season in the spring, the convective rain in summer, the typhoon rain in summer and autumn, but it does not rain in every day (or week) during crop growing period. The forests on the top of mountains can intercept lots of rainfall to reduce runoff loss in rainy days and let water slowly flow out from forests to terraces to continuously provide crops with water. Therefore, forests play an important role in improving effectively the unbalanced distribution of water in time and space.

Secondly, the ponds, which are usually built near villages and above terraces and connected to the forests on the top of mountains and the terraces below them through ditches, are mainly used to supply villagers with domestic water. The water in ponds can be renewed continuously due to water inpouring from forests and flowing out to terraces. The structure and water circulation mechanism of the pond in Lianhe Terraces make the local people have enough water resource with good quality.

Thirdly, a complex ditch system consisting of trunk ditches and branch ditches and overflow weirs dug on terraced ridges connects all the terraced patches together. It does not only ensure that each patch of terraces can get enough water but also makes the redundant water flow out from terraces. For example, the trunk and the branch ditches mainly collect water from the forests and divert them to terraces in the dry season, and discharge rainwater to rivers in the rainy season. The overflow weirs in each piece of terraces mainly keep the fields in a stable water depth to meet requirement of crop growth (Figure 1-5-29).



**Figure 1-5-29 Overflow weirs in the terraced ridges of Lianhe Terraces**

The abundant rainfall and the scientific landscape structure in Youxi Lianhe terrace ensure enough water for the production and living of local people. The water resource management system in Lianhe Terraces plays an important role in water conservation, soil retention and biodiversity conservation.



### 1.5.3 Temporal variation in landscape

The landscape in the four rice terraces varies with time, which is different in different seasons. In spring, these terraces are filled with abundant water, which look like mirrors. In summer, the terraces are filled with young and green rice seedlings. In autumn, they are filled with golden rice which is ready for harvest. In winter, they are covered by white snow, sometimes.



Spring

Summer

Autumn

Winter

**Figure 1-5-30 Landscape of Chongyi Hakka Terraces in four seasons**



Spring

Summer

Autumn

Winter

**Figure 1-5-31 Landscape of Longji Terraces in four seasons**



Spring

Summer

Autumn

Winter

**Figure 1-5-32 Landscape of Ziquejie Terraces in four seasons**



Spring

Summer

Autumn

Winter

**Figure 1-5-33 Time diversity in the landscape of Lianhe Terraces**



## 2 Historic relevance

### 2.1 Origin and evolution

China has a very long history of constructing terraces. It can be traced back to Western Zhou Dynasty when a verse referred to Ban Tian (“阪田”) which are fields on the hillside. The verse appeared as early as 776 BC, indicating that there were already Ban Tian (“阪田”) 3000 years ago. It is demonstrated that “阪田” is the prototype of terraces. In the Han Dynasty, Qu Tian (“区田”) appeared. Ups and downs of scattered field built in hills, steep slopes and mounds are recognized as terraces. In the Tang Dynasty, mountain exploitation received more and more attention, so terraces were developed well. Since then, literati have begun to eulogize them which led to the appearance of the normalized concept of terraces that are called Ti Tian (“梯田”).

#### 2.1.1 Chongyi Hakka Terraces

##### (1) Built in Song Dynasty

The Hakka ancestors moved to Chongyi in the Tang and Song Dynasties (618-1279). But the terrace distribution in Jiangxi Province was first recorded in the *General History and China's Agriculture (Volume Song, Liao, Xia, Jin and Yuan Dynasties)* and *Register of Mounting a Simurgh* written by Fan Chengda in the Song Dynasty (960-1279). It can be preliminarily judged that Chongyi Hakka Terraces appeared no later than the Southern Song Dynasty, and has a time-honored history of 800 years at least. With the origin and evolution of Chongyi Hakka Terraces, the Hakka ancestors got used to the mountainous areas, survived and multiplied in Southern Jiangxi Province.

In the Southern Song Dynasty (1127-1279), local people made a living by cultivating terraces mainly on the flat slopes in mountain areas and valleys. The terraces were merely dotted on the mountains on a small scale, leaving the higher slopes yet to be cultivated. This was regarded as the original stage of the Hakka Terraces. The main characteristics are: that ponds are built on slopes to store rainwater, and the flowing springs were channeled to the terrace through ditches and bamboo conduits. Crops growing on the terrace were mainly long-stalked rice, a single species that was planted for years. As the folk sayings goes, “One single species of rice planted for years makes people bend down with tiredness.”

##### (3) Enlarged in Ming and Qing Dynasties

According to *On the Dredging Governance of Chongyi County* written by Wang Shouren (Wang Yangming), a philosopher of Neo-Confucianism and censor of the supervision department in the Ming Dynasty (1368 – 1644), as well as *General Records of Chongyi County* and *Pedigree of the Wang Family in Chongyi* written under the reign of Emperor Tongzhi in the Qing Dynasty (1644 – 1911), during the Ming and Qing Dynasties (1368 – 1911), the Hakka region in southern Jiangxi received a

great number of migrants from Fujian and Guangdong, who brought food crops, such as varieties of corn, yams, and cash crops, such as tobacco and beans. This period is regarded as the Hakka migration from Fujian and Guangdong. To make a living, the migrated Hakka ancestors built houses on the mountain and opened the mountains for farmland. Meanwhile, the imperial court encouraged the reclamation of wasteland for cultivation. According to the *General Records of Shangbao Township*, “in the first year under the reign of Emperor Kangxi (1661), policies were carried out to emphasize agriculture, reward cultivation in remote areas with 4-8 taels of silver for each 0.07 ha. For this reason, a host of families came in, and the number of households rose dramatically from 10 to 50.” In this period, terraces were fundamentally reclaimed. In the 29<sup>th</sup> year under the reign of Emperor Qianlong (1764) and during the reign of Emperor Jiaqing (1796-1820), massive landslides broke out, resulting in mud and stone slides which inundated farmland. People began to control water and slopes while building terraces.

#### **(4) Stable from the end of Qing Dynasty**

Since the end of the Qing Dynasty, the Chongyi Hakka Terraces have been stable in scale. In this period, terrace reclamation is associated with mountain and water control. More importantly, complete technology and theories on terrace cultivation have been developed in practice.

### **2.1.2 Longsheng Longji Terraces**

The primitive japonica rice had been grown in the Nanling Mountainous areas where Longsheng County is located 6 000--12 000 years ago, one of the source-lands of cultivated rice in the world. The history of reclamation has been well documented for about 800 years.

#### **(1) Built in Tang and Song Dynasties**

According to the poem of famous poet Zhang Xiaoxiang in the South Song Dynasty: "Introduction: When going outing a couple of days ago, I saw the seedlings withering in the fields, but when passing the Xing'an County today, I witnessed the plants flourishing under irrigation, prospective big harvest scenes meet my eyes on every side. The efficient governance by efficient governors were thus evidenced, so I immediately reported this to the secretary officer Zhang Zhongqin", the poem goes: The wooden water wheel spinning, whose wooden pipes standing high; Young rices are being nourished by ever-new water, whose surplus having grass to satisfy. It is the magistrate that sprays the dew, whose manner of carrying out is thunder-like; I would charge my glass with a spoon of this new water, and drink a toast to our white knight. These villages were small or big, and Zhonglu, the center of the Longji Terraces of the Longji area used to be governed by Xing'an County, showing that the Longji Terraced Fields had taken good shapes in the Song Dynasty.

## **(2) Enlarged in Ming and Qing Dynasties**

According to The Annals of Longsheng County in the 26th year during the reign of Daoguang (1864) of the Qing Dynasty, "The Longsheng County covered an area with over 300 li in diameter, and the County Town was in the center, radiating over 100 li into all directions within the county, and in between there are hundreds of lofty mountains, high ranges and steep cliffs, with little plains or clearings."

### **2.1.3 Xinhua Ziquejie Terraces**

#### **(1) Evolved from Qin Dynasty**

The Ziquejie Terraces has a long history. It is called Qin Dynasty Terraces by local people. Since the ancestor who lived in this region has no direct written record of its history, the historical research of this region is mainly based on the research of relevant literatures, surname genealogy records and genealogy records. In 1998, three grinded stone spears were excavated from Longxi Village of Wentian Town in Xinhua County, which were identified by the experts as weapons of the late Neolithic Age. This proved that ancient people had already lived in Ziquejie Terraces in the late Neolithic Age. A paper by Chen Changbing (a senior licentiate) was recorded in the Xinhua County Annals in Dao Guang period of the Qing Dynasty (1782-1850). It recorded that a person surnamed Feng hid in this region to take refuge from the wars in the Qin Dynasty. He lived beneath the rocks and took grass, fruits and vegetables from the nature to survive. But later he disappeared and never was heard of. Local people built the Tianyun temple to worship him. This record serves as the evidence that the Ziquejie region was already populated by human in the Qin Dynasty.

#### **(2) Built in Tang and Song Dynasties**

In Tang and Song Dynasties, the imperial government encouraged cultivation on terraced fields. It had been very popular in Hunan in the Song Dynasty. According to the Xinhua Records of Geographical Names, Louxia Village in Shuiche Town is inhabited by a tribe surnamed Luo in the years of Taipingxingguo in the Northern Song Dynasty (976-983). The village name of Louxia was given by the terraced fields on the slopes behind the village which looked similar to stairs. It shows that the terraced fields in Ziquejie region had already had a larger scale as early as the Northern Song Dynasty. In 1072, Zhang Chun wrote a poem entitled Cultivation of Meishan, which says that continuous houses are mainly plank houses while the terraced lands are most barren when the people mainly rely on slash-and-burn farming method, which served as the recorded authentic description of the development of terraced fields in Xinhua County by Miao, Yao and other ethnic groups at that time.

### **(3) Enlarged in Ming and Qing Dynasties**

The scale of terraced fields enlarged gradually during the Ming and Qing Dynasties. With the development of terraced fields in the Ziquejie region, many public facilities providing direct service for the agricultural production had been built up. Take the tea-booth along the Xixihe River as an example; more than ten tea-booths were built successively in Ming and Qing Dynasties, including Danru Pavilion, Jiqing Ting Pavilion, Zerun Pavilion and a dozen of other Pavilions.

### **(4) Nationality development history**

In the ancient time, the ethnic groups living in the Ziquejie Terraces region are descendants of Miao, Yao, and so on. Currently, the Ziquejie Terraces region is dominated by Han Nationality. Historically, some clansmen of Miao and Yao were dead in wars, some of them moved to other regions, while some of them integrated with the Han people. Especially after the Song Dynasty when the imperial government adopted the policy that cattle and seeds would be given to anyone who choose to register in this region. People would be provided with paddy fields and dry lands after they completed household registration. Meanwhile, people of ethnic groups who were outstanding would also be given the opportunity to take official positions. With all these measures, many ethnic people in Meishan region were gradually assimilated.

## **2.1.4 Youxi Lianhe Terraces**

### **(1) Evolved from Jin Dynasty to North and South Dynasties**

According to *History of Nine Kingdoms* and *Jian'ou County Annals*, wars broke out continuously in Central Plains after the “Yongjia Turmoil” (304 A.D.). Many literati and officials sought asylum in Fujian with their families. Most of them went to the upstream of the Minjiang River and Youxi is one of the important destinations for migration. During the “Hou Jing’s Rebellion” (548 A.D.), people in Zhejiang migrated to Fujian to escape from war and brought advanced agricultural technologies from Central Plains and Zhejiang, accelerating the agricultural development in Youxi. According to *Youxi County Annals*, most people in Youxi lived along streams in mountains. There might be terraces with gentle slopes. The agriculture is in the stage of extensive operation as a whole.

### **(2) Built in Tang Dynasty**

The population of Youxi continued to increase in the Tang Dynasty (618 A.D.). Youxi became a county in the 29<sup>th</sup> year under the reign of Emperor Xuanzong (741 A.D.). Since the An Lushan Rebellion (755 A.D.), wars broke out continuously in the north. Many families in the north marched to Fujian to escape from the war. The population of Youxi increased continuously. In the Tang Dynasty, the agriculture in Fujian turned to intensive operation from extensive operation, and the agriculture



began to develop on the mountain. According to the Cao's ancestral spectrum of Lianhe Township, Youxi, the Cao's migrated to Ziran Village, the south end of the south village, Lianhe Township from Shaxian County in the Tang Dynasty. It means that the Youxi Lianhe terrace was reclaimed at that time, so it has a history of over 1300 years.

### **(3) Enlarged from Song Dynasty to Qing Dynasty**

During the Jingkang Turmoil (1126 A.D.-1127 A.D.) of the late of the Northern Song to the Southern Song (1127A.D. – 1279 A.D.) and the Yuan Dynasty (1271 A.D. - 1368 A.D.), people fled to the south due to wars. The population of Fujian rose rapidly. “Fujian has a large population and few fields. It's hard to make a living here.” It means areas in northern Fujian have a large population and few fields. “There are many mountains and silty fields. People start to farm on mountains. Plants on slopes and boundary paths of rice fields are everywhere to see in the mountain just like seal characters”. It shows that the terraced landscape was very popular in Fujian in the Song Dynasty. The Tiger Subduing Temple in Lianhe Township was built in the Southern Song due to troubles caused by tigers. At that time, terraces developed on the mountain in Lianhe were on a certain scale.

People in Fujian began to move to other provinces and remote areas in the province due to the large population and few fields in the period of Ming and Qing Dynasty. According to the family name genealogy of Lianhe Township in Youxi County, people moved to Lianhe Township and the period is an important stage for the formation of scale of Lianhe terraces.

### **(4) Stable from the beginning of the 20th century to now**

In the 20<sup>th</sup> century, people in Fujian moved out in large scale twice. However, according to the family name genealogy of Lianhe Terraces, few families have moved out from the beginning of the 20<sup>th</sup> century to this day. The area of Lianhe Terraces has changed little and the scale of Lianhe Terraces has been stable since the beginning of the 20<sup>th</sup> century.

## **2.2 Historic relevance**

### **2.2.1 Models of harmonious coexistence between man and nature**

The four rice terraces have been built by the local people on the local topography, geology, soil and water resources features, representing the co-adaptation results of the local people with the local environment. Natural gravity irrigation systems have been created by the local people with simple engineering facilities, which are of great importance for local agricultural production especially during the periods of droughts. The local people have also attached great importance to the conservation of forests on the top of the mountain and applied an abundance of traditional knowledge and adapted technologies in agricultural production, which contribute greatly to the conservation of soil and water

in these mountainous areas. Adapting to the local environment to the largest degree, these terraces have not only played an important part in the food and livelihood maintenance of the local people, but have also been of great significance for the maintenance of the local environment, therefore being considered as models of harmonious coexistence between man and nature.

A host of migrants moved to Chongyi for local resources. Terrace reclamation and expansion is an inevitable choice when the Hakka faced with the contradiction between the growing population and insufficient cultivable land. Meanwhile, disasters such as massive landslides and debris flow drive the Hakka to improve their means of terrace reclamation, which is combined with the control of mountain land and water. The Hakka ancestors summarized a series of knowledge on farm work and practical skills in their production. Terrace cultivation was not only an effective way to put the water and land loss under control and prevent natural disasters, but also succeeded in nurturing the Hakka for generations and ensured the eco-security for the local population on the premise of sustainable development of resources and the environment.

The historical proof for the harmonious coexistence between man and nature in the Longji terraces mainly includes three aspects: (1) The technique of steeping slope reclamation, the Longji terraces ridges are built with stones and mud, generally being 20 to 30 cm higher than terraces. Constructing the terrace building on clay slopes and using straight moso bamboos to make the fields plain. (2) Management technology of fertilizer: the fertilizers of the Longji terraced fields mainly come from the barnyard manures dropped by cattle, horse, sheep and pig raised, another way of fertilization is called "cutting grass", cutting young grasses and collecting leafs on the mountains and then bury them under the furrows of paddy fields; (3) Village regulations, agreements and the patriarchal system which are used for protecting crops, forests, soil resources and distributing water resources. By using these institutions, the harmony of human and nature is realized.

The formation and development of the Ziquejie Terraces is not only the harmonious coexistence process with the ingenious terraced fields constructed in the steep mountain area by the ancestors of local farmers, but also the integration process of ethnic groups including Miao, Yao, Dong, Han, and others. Through exchange and integration of farming technology, lifestyle, culture, religion and so on, people from different ethnic groups have realized the in-depth exchanges on the terraced field farming culture, so as to achieve the sustainable development of terraced fields. Ziquejie Terraces have supported the survival of many ethnic groups in this region especially since the Song Dynasty when the government completed the cultivation of Meishan region. The war continued year after year in other areas, while Ziquejie Terraces enjoyed peace when the whole country was in war and enjoyed harvest when the whole country suffered from severe droughts. Ziquejie Terraces is one of the very important rice bases. Except for meeting the food safety of local farmers, its rice products was started to be sold to other places since Qing Dynasty.

In history, the ancestors of people in Lianhe Terraces brought a host of agricultural technologies from Central Plains and adopted these technologies to reclaim terraces and develop agriculture. Through generation and generation working, people in Lianhe Terraces created the three dimensional terraced landscape with natural gravity irrigation system and lots of new agricultural patterns in harmony with the local natural environment. The terraced landscape structure makes Lianhe Terraces enjoy enough water for agriculture production and then provide rich food for local people. Today, the landscape is still conserved in good condition and plays a part in livelihood of farmers. The people in Lianhe Terraces also created a great many traditional ecological planting patterns, for example, diversified compound planting, intercropping of different varieties and rotation cropping. These

planting patterns maintain the terraced agri-biodiversity and keep the soil healthy and fertile of the terraces as well as reduce the use amount of agricultural chemical inputs, and ensure agricultural sustainability. Besides, so many local people still conduct to farm according to ecological methods. Obviously, Lianhe Terraces are a model of coexistence between man and nature having abundant traditional agricultural knowledge such as agricultural proverbs and songs, taboos and worships. .

## **2.2.2 Important components of Chinese agri-culture**

China has a very long history of constructing terraces and terraces have not only made great contributions to the sustainable development of agriculture but have also constituted important components of agri-culture in China. The four rice terraces are the co-adaptation results of the local people with the local environment, which are both a representation of the wisdom of the local people and a manifestation of the local culture. During the process of terrace construction and maintenance as well as rice cultivation, a great amount of traditional knowledge and adapted technologies have been applied and an abundance of festivals, customs, folklores, folk songs and farming proverbs have emerged which have together formed distinctive terrace cultures in the Chinese history. In addition, some terraces are the places where different ethnic groups and different farming cultures have converged in the long history of development, therefore manifesting particular attributes and possessing important positions in Chinese agri-culture.

As the people living on hills, the Hakka are blessed with the wisdom to respect nature and have the pioneering spirit of persistence. They actively adapted to the tough geographical circumstances and formed their unique culture after integrating culture in the south and in the north. They made a marriage of the rice culture and the hilly terrain in the south. The terraces that the Hakka reclaimed and maintained for generations demonstrated the most distinctive Hakka culture in the physical aspect. Terrace cultivation implies the Hakka's wisdom on changing the natural environment and utilizing the natural resources in a compatible way. Terrace cultivation is also the individualized representation of the "culture in a settled society" in the Hakka culture, and is regarded as the most profound reason for many cultural phenomena such as Hakka dialects, patriarchal society, folk songs and legends.

For the past over two thousand years, the Longji Terraces have been blended into the life of the local people in terms of lifestyle, diets, customs, wedding and funeral rites and showcases the ancient terrace farming civilization and wisdom of China, and ideally reflect the brilliant culture and ethnic ways of life and customs of Zhuang, Yao and other peoples. The agri-culture of the Longji Terraces are characterized by the following features: (1)Long History of Agricultural Productions. The primitive japonica rice had been grown in the Nanling Mountainous areas where Longsheng County is located 6 000--12 000 years ago, one of the source-lands of cultivated rice in the world; (2)Rice Culture with Unique Features. The Longji terrace culture covers not only the rice-centered agricultural production and its related culture, but more importantly, the emotional sublimation and unique life significance derived from the rice culture soaked in every corner of the local social life; (3) Complete Production Technology System. A complete set of adaptive techniques of agricultural production had been formed on the basis of the production experience; (4) Ethnic Culture with Distinct Characters and Rich Local Colors. For the past over two thousand years, the Longji Terraces have been blended into the life of the local people.

In the Ziquejie Terraces, 70% of the Meishan region is mountainous areas while 20% are cultivated lands and the rest 10% are water system. The Ziquejie Terraces has the traditional agriculture

pattern in southern China by incorporating rice cultivation in terraced fields and fishing and hunting in mountainous regions. This pattern provides main products necessary for daily life of local farmer in the Ziquejie Terraces, which has been the important economic mode of production in this region for thousands of years. Until now, the historical fishing and hunting culture in mountainous regions can be still traced from lifestyle of local farmers in the Ziquejie terraces, such as the worship for Zhang Wulang, who was not only the founder that cultivated the mountains and pioneered the farming in lands, but also a master in hunting and fishing. Historically, many poets or writers also lively documented the unique mode of production in the Ziquejie Terraces through their rich literature works.

Lianhe Terraces system is a type of terraces developed by Han people. It is one of the most ancient terraces conserved by now in China. With the experiences accumulated for more than a thousand years, the local people have formed their own traditional farming cultures. These local farming cultures are the representative of the excellent Chinese agricultural culture. The tradition farming cultures are kept in good conditions due to inconvenient traffic and less impact from the outside culture. The preservation of the cultures can help to protect the integrity of Chinese traditional farming culture. Besides, a stable terraced ecosystem can ensure human reproduction and the inheritance and development of culture. Local people in Lianhe Terraces still reserve a lot of traditional festivals, etiquette and customs due to daily terrace farm work. They also keep lots of traditional knowledge such as resistance to natural disasters, and the stability of living conditions and other living environments in the terraced areas. These etiquette and customs play an important role in the inheritance of farming culture and have special historical and cultural values.

### **2.2.3 Valuable experiences of ecological agriculture in China**

The local people in the four rice terraces believe in traditional concepts of environmental protection that are embedded in their cultures. Their ecological philosophy contains profound ecological ethics and rich agricultural wisdom, which has become the prerequisite for the emergency of ecological agriculture in these areas. The terraces they built are adapted to the local environment to the largest degree, comprised of forests, terraced fields, villages and rivers. The four elements interact with each other and have formed a good, strong ecological cycle. The production activities they conducted in the terraces are highly consistent with the rules of the nature by adopting a variety of production patterns and applying traditional knowledge and adapted technologies continually. Due to these activities, an abundance of agricultural biodiversity has been well conserved and important ecosystem services are still functioning well in these terraces. It is proved that these terraces have provided a great amount of experiences for the development of ecological agriculture in China.

The Hakka in Chongyi have preferred to cultivate traditional rice (commonly known as "old rice") since ancient times. Traditional delicacies, such as the Huangyuan glutinous rice cakes, often use traditional rice as the main ingredient. That's why the local traditional species are effectively conserved. Diversified modes and technology of cultivation help improve the diversity of species and the genes in the ecosystem, and the benefit from the control of damage by diseases, weeds and insects, by developing a cyclical traditional way which begins organically, grows organically and ends in an organic form. It is effective to maintain the sustainable development of local agriculture.

The Longji Terraces are priceless legacy inherited from the forefathers of Zhuang and Yao peoples who applied the traditional Chinese philosophical conception of "unity of heaven and earth" together with their wisdom and talents to the mountainous areas to create wonders. Compared with the similar



resources abroad, the Longji Terraces show a remarkable uniqueness and creativeness, including: (1) a perfect system of production of forests on mountain tops, villages on mountainsides and terraced fields at sides or foot of villages are benefit for water and soil protection; (2) a complete system of irrigation construction and management techniques by making use of with local geography and climate to conserve Longji terraces; (3) a reasonable traditional technical system of water, soil and fertilizer conservation and application to reduce environment pollution; (4) rich resources of crop seeds germplasm to show the biodiversity; (5) relevant folk conventions and stipulations to ensure the sustainable development of the system.

In the long history of reclamation and cultivation activities, ancestors of the Ziquejie Terraces had to overcome the harsh natural conditions of steep terrain. The Ziquejie Terraces is very steep and the slope of most terraced fields exceeds 25°. This special natural condition forced people to be more cautious about the possible adverse consequences of their production and life behaviors on the environment and thus to attach more emphasis on the protection of the environment. In addition, the history of this region is filled with the outbreaks of long and large-scale military conflicts between the central government and the Miao, Yao and other ethnic groups, which forced the production of the Ziquejie Terraces to be prioritized to supply necessary military materials for a large number of troops. All these reasons have made the ancestors in the Ziquejie region to improve their farming methods, improve water conservation and fertilizer retention, and strengthen the ecological benefits of rice cultivation to ensure the sustainable support ability of terraced fields. During the long-term agricultural practice of local farmers, the thought of ecological agriculture is deep-rooted in their mind, which is valuable experience to learn by others.

The development of Lianhe Terraces have experienced over 1300 years. They developed and kept the traditional farming skills adapting to local conditions and environment, for example, the rice cropping system suitable for terraces in different altitudes, cultivation techniques for single cropping rice and pollution-free rice, techniques to raise rice seedlings on upland fields, cultivation techniques for ridges and furrows, cultivation techniques for regeneration rice. Meanwhile, there are many types of farming patterns for Lianhe Terraces, such as rice-fish co-cropping, rice-duck co-cropping, rice-potato rotation and rice-grass rotation. Lianhe Terraces also inherited and developed ecological and environmental field fertilizing techniques, de-insectization techniques, and animal farming techniques. These farming patterns fully reflect the ecological idea of harmony between man and nature in terms of conservation of water and soil, water conservation, climate regulation, disease, insect pest and weed control, nutrient cycling, etc. They also reflect the ecological value standard for the use of natural laws based on respect for nature. Therefore, the traditional farming technologies of Lianhe Terraces provide valuable experiences for China's construction of ecological agriculture.

### 3 Contemporary relevance

Having survived for many hundreds of years and endured the depredations of droughts, famines, plagues, floods and wars, the four rice terraces are considered as representatives of sustainability. Their exceptional ecological, social, cultural, scientific and demonstration values are of great importance for the contemporary society.

#### 3.1 Beneficial for livelihood security and local development

The four rice terraces are characterized as multi-functional, still playing a very important role in the maintenance of livelihood security and the development of local economy in the contemporary society. On the one hand, environmentally friendly farming practices and excellent environmental qualities have enabled local farmers in the four rice terraces to develop high-quality agricultural products which have brought considerable revenues for both the farmers and the proposed sites. On the other hand, the four rice terraces are famous for good eco-environment, beautiful landscapes and distinctive agri-cultures which are all important tourism resources that have brought numerous tourists every year and contributed a lot to the development of local economy.

The traditional eco-agricultural development of Chongyi Hakka Terraces enjoys more advantages with each passing year. The gross output value of agriculture in 2001-2016 shows a significant growth (Figure 3-1-1). In 2016, the gross output value of farming, forestry, animal husbandry and fishery reached 301 million yuan, up 6.2% compared with last year. Of these, output value of farming and forestry reached 84.15 million yuan and 129.9 million yuan, up 6.3% and 6.4%, respectively. According to statistics, the added value of agriculture stood at 209.3 million yuan, up 6.2%; Agricultural taxation reached 6.9 million yuan, contributing 3.23% of the total local fiscal revenue.

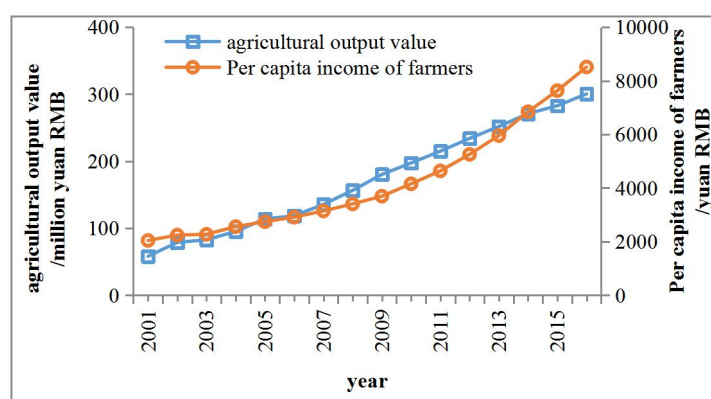


Figure 3-1-1 Trend of economic data of agriculture in Chongyi in 2001-2016

Rice is major crop of terraced farming, the continued cultivation of rice in the system can ensure 411 kg grains per capita for more than 15 000 farmers: thus food security of self-sufficiency has been realized. A national level traditional agro-system integrating the terraces sightseeing, leisure travels, folk culture hand-on experience and scenic resources protection has been formed in the Longji terraces,

with the Longji terraces as an important resource for the agricultural and tourism incomes of the Longji town. In 2015, more than 1 million visitors came here to travel, and in the cultural heritage tourism industry of Longji Terrace, more than 64 million *yuan* (RMB) have been earned. And in 2016, the gross output value of farming, forestry, animal husbandry and fishery reached 250.31 million *yuan*, up 19.6% compared with last year (Figure 3-1-2). There are a dozen of tourist companies in the Longsheng County including Longji Tour Company, Longji Canyon Drifting Company, Hotspring Company and Pengzu Mountain Company, with a total social tourism investment of 2.2 billion *yuan* (RMB) in 2014 and 20,000 direct employees and 50,000 indirect employees.

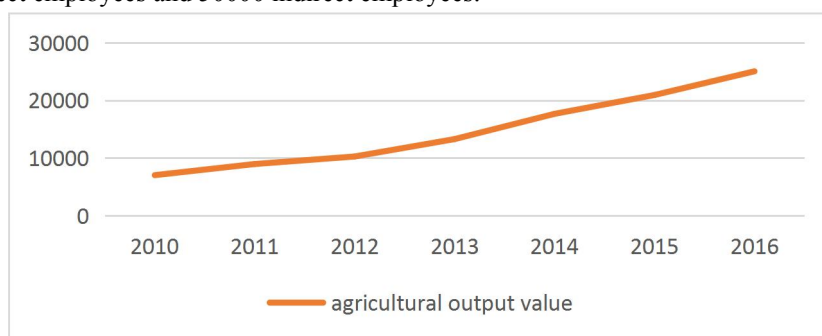


Figure 3-1-2 Trend of economic data of agriculture in Longji Terraces in 2010-2016

Local farmers in Ziquejie Terraces take advantage of the traditional farming knowledge and technology and the excellent ecological environment to develop high-quality agricultural production, to carry out deep processing of agricultural products and brand building in order to increase the added value for agricultural products. Currently, eight agricultural enterprises have been established in Ziquejie Terraces. Some of their agricultural products have received the certification of organic, green product, or geographical indications. The “black tribute rice” brand has been created. The demonstration base of “black rice”, “red rice” and rice-fish farming have been set up. There is also the national ecological demonstration base of organic rice cultivation. Unique landscape system, rich tourism resources and unique regional culture of the Ziquejie Terraces provide favorable conditions for the development of recreational agriculture in this region. The Ziquejie Terraces was approved as National Scenic Spot in December 2005, National AAAA Tourist Attraction in December 2012, and World Heritage Irrigation Structure in 2014. All these made the Ziquejie Terraces a place with a high agricultural value and nature tourism value.

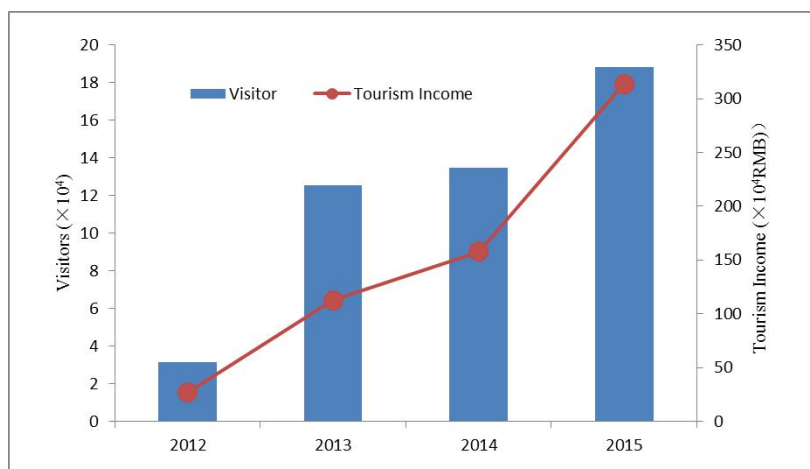


Figure 3-1-3 Change of visitors and tourism income in Ziquejie Terraces from 2012 to 2015

Lianhe Terraces as an agricultural production system still play a part in economic development. In recent years, the food yield of Lianhe Terraces remains stable under the background of the urbanization (Figure 3-1-4), moreover, the value of agricultural production increases continuously owing to developing high-quality agriculture such as organic production (Figure 3-1-4). In the past six years, value of agricultural production increased by 42.1% and improved effectively income of farmers in Lianhe Terraces. In addition, the beautiful landscape, featured delicious food, special cultural conventions and clean natural environment are important tourism resources. Lianhe Terraces have become a tourism hot place. According to statistical data, there are 120 thousand tourists and 13.1 million *yuan* from terraced tourism in 2016, which increased by 25% in tourist amount and by 24% in tourism income comparing with the data in 2011. In sum, the economic income of farmers can be greatly increased by developing green and organic agriculture and tourism industry.

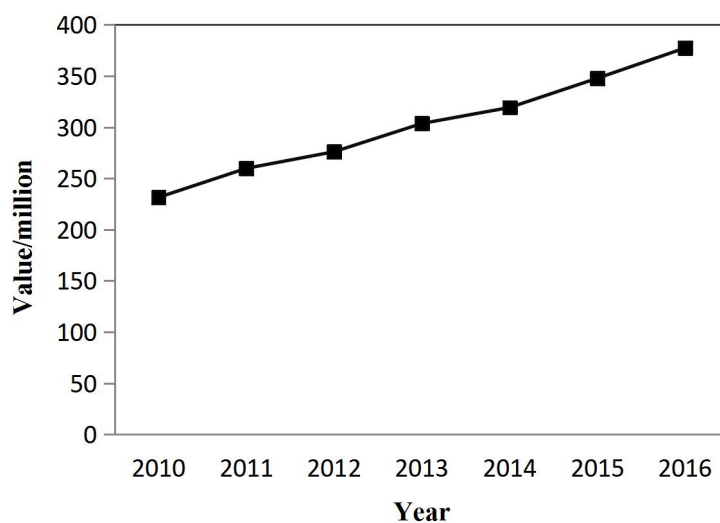


Figure 3-1-4 Agricultural production change in Lianhe Terraces from 2010 to 2016

## 3.2 Beneficial for the conservation of biological and genetic resources

The four rice terraces are considered as important pools of biological and genetic resources, as many different kinds of traditional varieties, especially rice varieties, and an abundance of plant, animal and microbial species have been well conserved in these terraces. The rich biodiversity is not only important to the maintenance of the terraces themselves, but also shows great values in the scientific research in the contemporary society.

Chongyi Hakka Terraces has maintained the complete traditions on terracing and cultivation, which helps solve the problem of hilly slopes that are not suitable for planting rice. With rich agricultural bio-resources and other eco-environmental resources, it keeps the original way of cultivation, and is blessed with abundant species and landscapes and distinctive land use patterns, and thus has the special significance and value for research. As the origin of Hakka farming work, the Hakka Terraces is of great importance to the research community on farming arrangements, farming tools, system and modes of farming, cultivation techniques, the reclamation and maintenance of terraces, formation of farming villages, social relationship and cultural development in villages,



biodiversity and cultural diversity.

Longji Terraces are rich in biodiversity, with unique fine quality rice varieties and many kinds of germplasm of plants and animals, including white home glutinous, fragrant glutinous rice, tonghe rice and so on. Fragrant glutinous rice is famous for fragrance, which is used for making ciba in the Spring Festival and engagement situation; tonghe rice is suitable for various of terraces. There are lots of ancient tea trees as valuable biology resources, phoenix chicken, green jade duck and other unique poultry species in Longji Terraces. Terraced ecosystem has a very important significance for protecting these germplasm resources. One of the important functions of Longji Terraces is to protect the biodiversity, especially the genetic diversity of all the living things via on-site protection. In recent years, many scholars have attached great importance to the research of genetic resources and ecological functions in Longji Terraces.

One of the key functions of the Ziquejie Terraces is to protect local traditional species and their growth environment in order to maintain biodiversity, especially in conserving the genetic diversity of traditional rice. Currently, there are 8 traditional rice varieties, with black tribute rice and red rice as the most famous ones in the Ziquejie Terraces. There are also some traditional species of other crops, such as finger millet, Tartary buckwheat, rice bean, and so on. The diversity of these traditional species is the foundation for maintaining agricultural diversity, life supporting system, and the stability of the ecosystem. In order to promote the conservation of traditional rice genetic germplasm in the Ziquejie terraces, a research base was set up in 2005 to carry out the research of different rice varieties. The experimental plots in different altitude gradients have been set up in Shuiche and Fengjia Townships.

In recent decades, with the rapid popularization of hybrid rice, transgenic technology, etc., the traditional crop varieties have been influenced greatly and many of them are disappearing. However, in Lianhe Terraces, plenty of local crop varieties are still conserved, including 72 traditional rice varieties, as well as many animal varieties like shanma duck, Muscovy duck, semi-Muscovy duck, and many plant varieties. These traditional crop varieties do not only benefit stability and sustainability of agri-ecosystem but also provide lots of genetic resources for crop varieties cultivation. Besides, enjoying micro-climate diversity, rich rainfall and clean farmland environment, Lianhe terraces have become important breeding experiment bases for Fujian Academy of Agricultural Sciences and Fujian Agriculture and Forestry University. All these advantages present that Lianhe Terraces are of great significance for modern agricultural sustainability.

### **3.3 Beneficial for coping with such ecological problems as soil erosion and climate change**

Besides biodiversity conservation, important ecosystem services like soil and water conservation, climate and gas regulation, air and water purification are still functioning well in the four rice terraces nowadays. Among them, the most remarkable ecological function is soil and water conservation. In the mountainous area of south China, soil and water erosion has always been a serious ecological problem, threatening the sustainability of both the local environment and the local society. The construction of terraces did not only solve this problem perfectly in the ancient times, but is serving now and will also serve in the future as a perfect solution to this problem. In addition, as the trend of climate warming is continuing, extreme climate comes more frequently that often causes severe droughts and floods.

Dense forests on the top of the terraces and ingenious natural gravity irrigation systems have enabled these terraces to adapt to the droughts and floods easily, which is of great inspiration for the contemporary society.

On Chongyi Hakka Terraces, the mountain agricultural system involving forest, bamboo, tea garden, villages, terrace and water is an ecosystem with rich biodiversity, landscape diversity and harmonious balance between man and nature. It makes full use of functions of forest and bamboo on soil and water conservation, air conditioning and environmental purification. Layers of terraces are changed into reservoirs, making the dried-out slopes into wetlands to store water. Flowing water runs throughout the terraces. Evaporated moisture turns into rainfall above the forest and bamboo. It, combined with the fixed carbon dioxide, released oxygen which impacts on temperature, forms a sound cyclical ecological chain linking forest, bamboo and terraces. This plays a sound regulating effect on the microclimate of terraces, and significantly helps to maintain the stability of agro-ecological system.

Influenced by rainstorms, the most serious disaster in Longji terraces is mountain torrents, which would collapse the terraced fields, swamp the crops and erode the water and soils in the mountain land. The vegetation on both sides of the terraced fields are well conserved, and the evergreen forest vegetation such as arbors, bushes and grasses are distributed in the cubic climate formed at different elevations, following the various contours of the mountains, which is beneficial to the water and soil conservation. Besides, water and soils are well held within the rands of rice terraces, and the local people pay a lot of attention to the protection of terraces by renovating the collapsed fields, prohibiting the construction of houses in the fields, and conserving the water and soils with the better drainage system. There is an organic habitation of more than a thousand of plant species such as arbors, bushes, herbs, ferns and mosses in the Longji Terraces Forest Eco-System, and various microclimates have been formed by forests at different altitudes, influencing the surroundings.

Ziquejie Terraces are an example of overall planning and exploitation of water and land resources and the fruit of Ziquejie people's wisdom and hard work. When building the terraces, Ziquejie people suited their measures to local conditions and retained the forest at high altitudes to guarantee the overall balance of water resources and environment; they built villages half way up the mountain where climate is milder and more suitable for human settlement; at low altitudes where climate is even warmer, they reclaimed terraces and set up water distribution system. The water conservation function of the forest and the water retention function of the terraces have brought ecological benefits: conserving soil and water, recharging groundwater, adjusting flood peak, water purification, conserving biodiversity, and regulating microclimate.

The dimensional landscape of Lianhe Terraces can reduce effectively the erosion of rainwater to hillside in rainy days through the forests on the top of mountains intercepting rainwater and terraces decreasing runoff speed, and then play an important role in preserving soils. According to studies, Lianhe Terraces is able to conserve soil amount of  $4.04 \times 10^7$  tons/year. Besides, Lianhe Terraces hardly confront the drought disaster due to its scientific landscape structure and natural gravity irrigation system. The good soil conservation function and high adaptivity to environment changes of Lianhe Terraces have precious reference value for other agricultural area.

### **3.4 Beneficial for the inheritance of traditional agri-culture**

Different ethnic groups combined with distinctive natural conditions have developed diversified agri-cultures in rice terraces of subtropic China, which are represented in festivals and customs, folk arts, food, dresses and architectures. Since all of these cultural elements are formed based on terrace cultivation, the terraces are their carriers and of great significance for their inheritance. Therefore, the maintenance of the terraces has greatly promoted the continuity of the agri-cultures and helped pass them down to the young generation, which is especially important in the contemporary society. Given that terrace cultures are an important part of Chinese traditional agri-culture, their successful inheritance is a valuable contribution to the inheritance of traditional agri-culture in China.

The terrace culture in Chongyi is mainly inherited by traditional means of ancient legends, folklore, revolutionary history and agricultural proverbs. The Hakka's farming technology, religious practice, village regulations and folk conventions, residential architecture, festival celebrations, costumes, performances and literature are all centered on terraces and saturated with the spirit of terrace culture. In the long history of terrace cultivation, the diligent and wise Hakka in Shangbao township in core area created many unique cultural art forms, such as the spring cattle culture, wine culture, and tea culture and farming culture, which are filled with deep rural and terrace features. All these come from the experiences accumulated in the long-term terrace cultivation and the daily life of the Hakka. The technology, experience, knowledge and system in the overall Hakka Terraces cultivation system are handed down to this day, which accords with the concept of sustainable development and the harmonious co-existence between man and nature.

Recent years have witnessed increasing academic interests in the Longji Terraces research: scholars conducted researches on the historical investigation, genetic resources, eco-functions, social structure, and economic status, with the academic scopes or perspectives of folk lore, history, anthropology, tourism studies, among others. The hottest issues are the Longji Terraces protection, the social historical transformation of the Longji people, the Longji tourism development, community participation, etc. For instance, some scholars deal with the internal relationship between rice culture and the Longji terraces landscape from the angle of ecology, some are concerned with the primitive original water recycling in the Longji Terraces, while others explore the survival mechanism and protection of the Longji Terraces and the extension of terrace building techniques, investigate the mechanism of longevity, or offer the suggestions for protecting the Longji rice culture and writing proposals for the World Culture Heritage. The established Longji Zhuang ecological museum, and the Longji terraced farmland agricultural culture system assimilate into all kinds of activities in the development, which has become a bright spot of new rural civilization construction and enhanced the national cultural identity of local people.

With the development of traditional agriculture, the price of the traditional rice is risen continuously. The income of local farmers was increased greatly. On the other hand, with the development of tourism agriculture in the Ziquejie Terraces, local farmers have engaged in processing of local agricultural products to sale in the tourist area. They set up shades or stalls to sell their locally produced agricultural products, such as black rice, red rice, and firewood smoked meats, finger millet, fish from the paddy fields, duck etc., which also increase their income. The development of traditional agriculture and tourism in the Ziquejie Terraces is more and more attractive. Some of the migrant

workers have decided to return home and started a business. For example, 18 people have already returned to Longpu Village to learn rice cultivation, rice-fish farming, rice-duck farming, and other traditional techniques. This helps to inherit the traditional farming knowledge and technology.

Cultures in Lianhe Terraces are close related to terraced agricultural production. For example, most traditional food is made of rice; the numerous folk songs are passed down from generation to generation in agricultural production; the festivals like “Cattle-Whipping to Welcome Spring” exist in terraced agricultural production; protection of traditional agricultural knowledge and technologies also depend on terraced production. If there were not these terraces, these traditional cultures would lose their existing significance or their inherited carriers, and would probably disappear. Thus, the conservation of Lianhe Terraces will play an important role in their cultural inheritance and development.



## 4 Threats and challenges

The four rice terraces have survived for hundreds of years, which have not only played an important role in the history but are also of great importance to contemporary society of China. The conservation of these terraces will not only bring remarkable economic and social benefits, but it will also produce important ecological benefits, relating to the sustainability of agriculture and rural community. However, their conservation is also faced with a series of similar threats and challenges from urbanization and industrialization.

### 4.1 Relatively low productivity and benefit

The limited area of farmland and high labor intensity in these terraces makes it impossible for them to form comparative effectiveness in terms of yield. Meanwhile, handicapped with the relatively low prices of ordinary agricultural products, undertaking agricultural production in most cases can not produce more benefits than non-agricultural undertakings. The relatively low productivity and benefits have greatly reduced farmers' enthusiasm to participate in agricultural production and therefore restricted the sustainable development of the proposed sites.

For example, the farmland in Chongyi accounts for merely 6.87% of the total. The rural net income per capita of Chongyi is 1,664 yuan, far below the disposable income of urban households (17,651 yuan).

Longji Terraces serve as an important resource for the agricultural and tourism income of Longsheng County. In 2015, 7.094 million visitors were received, and 6.339 billion *yuan* were earned from the tourism industry featured with Longji Terrace Scenic Zone of Longsheng County. In contrast, agricultural production is a heavy task which requires a lot of manpower but contributes relatively less to the local economy. Under this influence, abandoning farming for migrant work or running a small business has become the first choice for some farmers.

Because of the limited space and narrow ridges of the terraced fields, all the agricultural activities can only be completed by manpower in Ziquejie Terraces. Its low productivity and high labor intensity greatly restricted the sustainable development of the Ziquejie Terraces. Generally, the cost for the whole process of cultivating rice in the terraced fields is 2465 yuan per mu in the Ziquejie Terraces, including the agricultural production materials and labor used. However, the market value of the rice products is only 2275 yuan per mu. The cost is even higher than the benefit.

The Dongbian Village in Lianhe Township is taken as a case. The input for the rice cultivation in 2015 was 21,912 yuan per hectare, including 18,000 yuan of labor cost which accounts for 82.1% of the total input. However, the output was only 22,500 yuan per hectare, so the profit from planting rice is minus (Table 4-1-1). From 2014 to 2016, the rice planting area in Lianhe Terraces accounted for 19.3%, 18.4%, and 17.7% of the total planting area of crops, respectively. rice planting area is also continually decreased, which decreased from 898.5 hm<sup>2</sup> in 2014 to 837.8 hm<sup>2</sup> in 2016.e . It is obvious that the low productivity and benefit are threatening the sustainability of rice production of Lianhe Terraces.

**Table 4-1-1 Input and output of rice cultivation in Dongbian Village of Lianhe Terraces in 2015**

Item	Category	Quantity	Unit	Total (yuan/ha)	Proportion (%)
Input	Seed	9	kg/ha	360	1.64
	labor time	214.5	d	18000	82.10
	Fertilizer	2022	kg	2041	9.30
	Film	10.5	kg	146	0.66
	Disinsection	60	times	1140	5.20
	Transportation expense	750	kg	225	0.10
	Total			21912	100.00
Output	Harvesting	7500	kg	22500	/

## 4.2 Labor loss and land abandonment

As mentioned before, terrace cultivation is characterized as high labor intensity, for terraced fields with limited space and narrow ridges can only be cultivated by manpower. This has greatly reduced the enthusiasm of farmers to participate in agricultural production. For farmers especially the young people, abandoning farming for migrant work or running a small business looks like a better choice. Therefore, aging of agricultural labors has become a common problem in these areas. The loss of young labors and the aging of agricultural labors have also brought about another problem that some of the farmland has become abandoned, which has also threatened the sustainability of these terraces.

Agricultural production needs more labor work, which reduces the enthusiasm of farmers for agricultural production in Hakka Terraces. The farmland that is easily cultivated is managed by relatives or friends, while the remote lands that are not easy to cultivate has no choice but to be left abandoned. In addition, in some villages, young people go out to work, leaving their parents and children behind. The left-behind are not capable enough to manage their contractual farmland, leaving part of lands uncultivated. At present, the uncultivated terrace area in the proposed site reaches 173.5 ha, in which the uncultivated area of Shangbao Township is 137.7 ha.

Under the impact of the market economy, the educated youths migrate to the cities to work, unwilling to do onerous farm labor in terraces. Moreover, as the traditional farming production involves long cycle length, big input, but low return, and the high economic stimulus from local tourism industry attracts the large quantity of labor into tourism services, the successor labor force is quite lacking for the terrace farming. At present, the farm labor in the terraced areas is mostly undertaken by farmers in their 50s. According to the field survey, some terraces began to cave in, or be abandoned, or go out of water-field cultivation into dry-field cultivation. The number of collapsed spots in the Longji Terraces reached 409, whose acreage occupying 7.14% of the total water-field. Most of farm labor is left to the stay-at-home daughter-in-laws or shared by themselves and their spouses. It is obvious that the massive part-time farm labor outflow caused the serious shortage of labor. Driven by economic interests, modern agricultural technology is constantly impacting traditional agricultural production methods, such as abuse of fertilizers.

Nowadays, more than 80% local farmers working in the terraced fields are at the age of 55-65, thus the aging of agricultural labors has becomes a big problem. In practice, because of the loss of

young labors, only the elderly, women and children were left behind to take on agricultural production, and it is difficult for them to protect the terraced fields effectively even they have strong willingness to do so. This will result in the gradual loss of the traditional farming techniques, the intensive farming methods, the traditional village rules and regulations, and the traditional folk customs. Land abandonment has already become a common phenomenon. The sustainable development of the Ziquejie Terraces will be greatly threatened. The inheritance of the traditional agriculture will also face great challenges. According to the field survey, more than 70% of young rural residents in the Ziquejie Terraces went out and became migrant workers and their non-farming income had accounted for 78% of the total household income.

In Lianhe Terraces, the local young is unwilling to work on rice farming work with great labor intensity, complex management and less profits. According to the survey on the age structure of labors, the farmers with older than 50 are 60% of farmer working on agricultural production, and the farmers younger than 30 are only 3% of the total farmers (Figure 4-2-1). Therefore, those who grasp the traditional farming methods are often the aged. In addition, about 70% of rural population moves to cities and towns each year for work, especially the population of young rural migrant worker is markedly increased. The loss of young rural labors results in difficulties in the inheritance and development of the traditional terraced-farming technology.

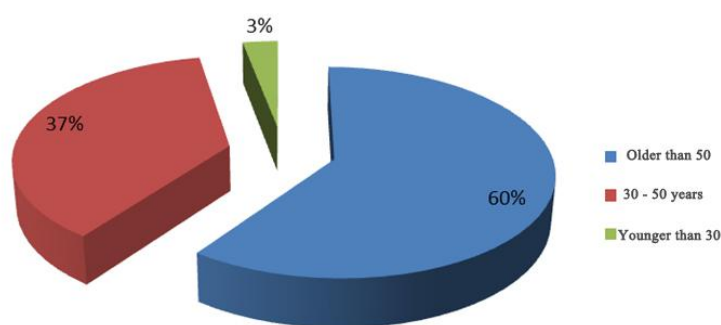


Figure 4-2-1 Age structure of labors for agricultural production in Lianhe Terraces

### 4.3 Traditional varieties, technologies and tools vanishing

Another threat comes from the decrease in the cultivated area of traditional rice varieties, which has also been witnessed in these terraces. This has been considered as an indication of loss of traditional rice species and increasing challenges posed to biodiversity. Currently, it is also easy to find that some paddy fields have been changed into dry land and traditional crops have given way to cash crops, besides some farmland being left deserted. Furthermore, with the introduction of modern agricultural technologies, farmers are prone to use fertilizer and pesticides to save time and labor instead of traditional technologies and tools. The vanishing of traditional varieties, technologies and tools has not only damaged the local environment, but also affected the inheritance of traditional farming skills.

Chongyi Hakka Terraces has paid special attention to intensive farming. The land was ploughed and harrowed twice or three times. Tender grass on ridges was weeded as much as possible, and grass in the farmland was cleared and collected as fertilizer. These years, most farmlands were ploughed and harrowed only once. Some winter vacant land even has rice seedlings transplanted without being ploughed or harrowed. In recent years, grass on ridges was seldom weeded, or the ridges themselves are poorly built. Herbicide was used for weeding, and cultivation was given less care than the traditional way that mainly relied on manpower and animal power with a low degree of mechanization. Some of the traditional farming tools have vanished. Some are vanishing, and some others are still in use (shown in [Table 4-3-1](#)).

**Table 4-3-1 Current use of traditional farming tools in Hakka Terraces**

Status	Farming tools
Vanished	Paddle wheel and wood wheelbarrow
Vanishing	Stone roller, barrel, windmill, stone mortar, rice huller and stone mill
Still in use	Plough, harrow, hoe, field knife, bamboo knife and sickle

Under the shock wave of the market economy, the trend of reforming the natural forest into mono-cultural mono-species forest for economic purposes reduced the species diversity of the forest and possibly would cause the drainage of germplasm, the phenomenon of cutting down the hundreds years old tea trees. Local wild flora and fauna species are threatened by alien species, which is causing the serious loss of genetic resources in agriculture. And the villagers hope to be able to cultivate more cultivated land to make a living, so a large number of forests were cut down, numerous grasslands were cleared, mountains became drylands, and drylands were transformed into terraces. Many excellent germplasm resources lose their unique habitat facing the loss of survival. For example, Magu cold water glutinous rice seeds had been missing since hybrid rice was extended. With the use of modern machinery and equipment, some traditional technologies and tools is vanishing, such as the Manual Rice-polishing Device which is a tool used to grain-husking.

Nowadays, the traditional animal-based intensive farming system in the Ziquejie Terraces has changed dramatically. The area of terraced fields with animal-based cultivation is also significantly reduced. According to the field survey, the number of cattle raised by the 183 households of Longpu Village in 2004 was 185. However it had decreased to only 20 in 210 households in 2014. Lacking of policy guidance, local farmers are inclined to cultivate hybrid rice with higher yield and relatively simple daily management, and also use chemical fertilizer and pesticides in the fields to ensure their livelihoods and the short-term economic benefits. At present, except for a few households that are members of the organic black rice production base, more than 80% of the local farmers choose to grow hybrid rice, causing the decrease in plantation of traditional rice varieties with local characteristics. If guidance is not put in place as soon as possible, under the impacts of modern agriculture, agriculture in the Ziquejie Terraces will be not only in the danger of losing the advanced concepts and agricultural wisdom inherent in the system, but also put its agricultural and cultural diversity under threats. Meanwhile, the inheritance of the traditional agriculture based on human-land harmony and intensive farming will also be challenged.

In Lianhe Terraces, the yield of traditional varieties of rice (about 4500 kg/ha) is just half of the yield of hybrid rice (more than 9000 kg/ha). Although traditional rice has a higher price (7-7.5 yuan/kg) than hybrid rice (about 3 yuan/kg), planting traditional rice with more labor input therefore gets a



similar benefit with planting hybrid rice due to the former spending more opportunity cost than the latter. Thus, some farmers tend to plant high-yield hybrid rice and use chemical fertilizers and pesticides. These behaviors have threatened the inheritance of traditional agricultural systems and varieties resources.

At present, the main rice varieties planted in Lianhe Terraces are stable-yield hybrid rice varieties such as II Youshen 98, Leyou 94, eII You 315. Only a few traditional varieties of rice such as Aijiaobai, Baitoupeng, Shiliuhong and Huhan are planted for several hectares while other traditional varieties are just cultivated in a small area for variety conservation. Planting hybrid rice in a large area easily has resulted in the loss of the traditional rice varieties and threatened biological diversity, therefore influencing negatively the stability of the local rice field ecosystem. In addition, the amount of chemical fertilizers and pesticides used in Lianhe Terraces has been witnessed on the increase (Figure 4-3-1 and Figure 4-3-2). Overuse of chemical fertilizers and pesticides will weaken the soil fertility and reduce the stability of the agroecosystem in a long term.

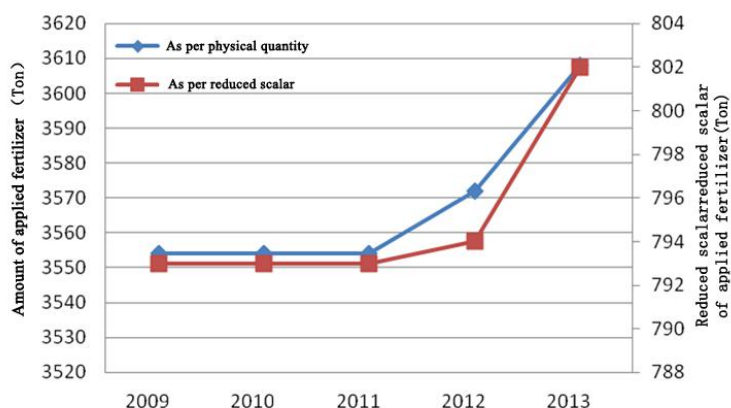


Figure 4-3-1 The amount of fertilizer applied in Lianhe Terraces from 2009 to 2013

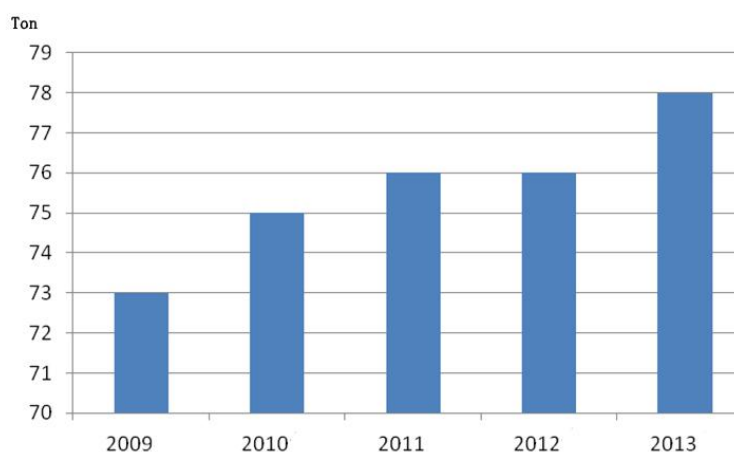


Figure 4-3-2 The amount of pesticide applied in Lianhe Terraces from 2009 to 2013

## 4.4 Discontinuity of traditional agri-culture

Traditional terrace cultures are also strongly influenced by urbanization and modernization. In the context of modernization, traditional modes of agricultural production with relatively low competitive

effectiveness have increasingly threatened by modern modes of production. What has changed also includes the life style of the local people, reflected in eating habits, customs and beliefs, festivals and ceremonies. With the cultural shock resulted from urbanization, various folk customs and activities are simply scorned to be so obsolete, conserved, backward and feudal that they must be abandoned. There is a cultural discontinuity between the old, who bear the traditional cultural identity, and the young, who should have been the successors of many cultural forms.

For example, the Hakka adolescents are strongly influenced by the modern culture. Various folk customs and activities are considered as obsolete and backward by them. At the same time, in the process of massive migration of rural population, numerous local cultural traditions, cultural activities and concepts that they are born with gradually slide out of people's view.

In Longji Terraces the ancient settlement closely related to the terrace landscape is losing its heritage ingredients caused by commercialization under the impact of modern culture and tourism, as evidenced in the weakening traditional values and conceptions of all the ethnic groups. The heritage of folk faiths, folk habits and customs bread through terraced farming and living in ancient villages for the past thousands of years is facing a serious threat under modernization. The cognition and consciousness on the values of Longji Terraces are still inadequate, and its protection lacks sufficient attention to the intangible heritage of Longji Terraces. This lacking is manifested as follows: the economic value is focused, other multiple values are ignored, especially the value and its inheritance of eco-culture and folk culture related to the Longji Terraces, causing possibly the disrupted collective memory until no cultural self-awareness can be awakened. Young people worship the prevailing custom and cultural tendency, reluctant to engage in heavy farming labor, or to study the terraced farming techniques, showing no interest in folk arts. The cultural legacy of father-son or master-pupil transmission may fail to be handed down further because of lacking successors.

The young generation of farmers is lack of interests in the knowledge and technology of traditional agriculture in Ziquejie Terraces. A field survey has showed that whether in terms of their recognition or inheritance, the level of the young group was significantly lower. For the elderly people, 100% of them thought that farming system, village regulations and folk customs were the agricultural heritage elements that need to be inherited, while the recognition rate among young people was only 33%; in particular, the recognition rate among part-time farmers, who were frequently working outside, and college students that return hometown, was only 25%. In all kinds of folk customs, young people under the age 40 had relatively high inheritance rate towards food culture and martial arts, with a rate about 70%. However, in terms of local folk songs, except for those young people who work in scenic spots and have been trained, most young people could not sing any folk songs.

As parts of traditional Chinese cultures, the intangible cultural heritages in Lianhe Terraces are of significant historical value. However, influenced by modern civilization and the new way of life, the younger generations are unwilling to undertake the rice farming work with great labor intensity and complex management, so the traditional agricultural culture knowledge and its maintenance are under threat. The local government or non-governmental organization did not organize local primary and secondary school students to learn traditional farming culture nor conduct relevant practices. Therefore, the traditional culture and customs can only exude charisma of ancient culture on the aged, while cultural discontinuity appears on the younger generation. Such isolated physical form as terrace and farming skills will be dull without the intangible cultural heritages they bear. How to inherit and develop the agricultural culture for a long time is a major problem at present.

# 5 Practical considerations

## 5.1 Ongoing efforts to promote GIAHS

The multi-stakeholders of the four rice terraces have made ongoing efforts to promote these terraces to apply for GIAHS, which are mainly represented in the following five aspects: institutional construction, capital investment, eco-product development, tourism development, publicity and popularization.

### 5.1.1 Institutional construction

A leadership team has been established in every terraces system to promote its application for GIAHS and a management office under the leadership team has been set up for the conservation and management of the terraces system. Most of these terraces have also built up a cooperative relationship with institutes and colleges to provide scientific support for the application of GIAHS. Besides, to promote the dynamic conservation and sustainable management of these terraces, the local governments have also formulated a set of policies involving farming subsidies, farmland transfer, farmer cooperatives, technology training and benefit sharing from tourism incomes. For details, please see [annexes 5 to 8](#).

### 5.1.2 Capital investment

Capital investment in these terraces mainly comes from the governments. As the governments pay more attention to the conservation of agricultural heritage systems, successive investment has been put into terraces maintenance, repairing of irrigation facilities, conservation of traditional varieties, inheritance of folk arts, eco-product development, tourism development and scientific research. Most of the investment is integrated with the existing funding schemes like the initiative of building new countryside and beautiful villages, the initiative of poverty alleviation, etc. For details, please see [annexes 5 to 8](#).

### 5.1.3 Eco-product development

The development of eco-products has always served as an important approach to promote the conservation and development of the agricultural heritage systems. In these terraces, a set of eco-product production bases have been established, many agricultural enterprises have been introduced, many agricultural products have been certified as pollution-free agricultural products, green food, organic food and products of with national geographic indications. For details, please see [annexes 5 to 8](#).

## **5.1.4 Tourism development**

Tourism has also been attached great importance to when it comes to the conservation and development of agricultural heritage systems. In these terraces, diversified agri-cultures have been deeply explored and integrated with the tourism development, therefore demonstrating the multi-functionality of agricultural heritage systems. In some terraces, tourism has become the pillar industry for the local economy and played a very important role in poverty alleviation. For details, please see [annexes 5 to 8](#).

## **5.1.5 Publicity and popularization**

In order to effectively conserve and manage these terraces, a series of thematic traditional arts and cultural activities have been organized. A variety of media also increased the publicity about the agri-cultures in these terraces. The local governments have also organized a series of training for farmers. In some terraces, a traditional farming culture museum has been constructed and opened for public and a documentary has been made to introduce the multiple values of the terraces in an all-round way. For details, please see [annexes 5 to 8](#).

# **5.2 Potentials and opportunities for sustainability and management of GIAHS**

## **5.2.1 Great attention paid to the conservation of agricultural heritage systems**

The protection of agricultural heritage, cultural ecology and traditional villages has long been a priority of the Chinese Government. As early as the 1950s, the State Council approved the establishment of the China Agricultural Heritage Research Laboratory, which studies agricultural history. In 2006, the State Council issued the *Outline of Cultural Development during the 11th Five-Year Plan Period*, which put forward the goals and tasks of cultural development. In 2007, the Intangible Cultural Heritage Protection Center was established. To protect and develop the traditional villages, the Ministry of Housing and Urban-Rural Development, the Ministry of Culture and the Ministry of Finance organized the first investigation and evaluation of traditional villages across the nation in 2012. The China-NIAHS initiative was started by the Ministry of Agriculture in 2012. By the end of June, 2017, a total of 91 traditional agricultural systems have been designated as China-NIAHS by the Ministry of Agriculture, including Chongyi Hakka Terraces, Longsheng Longji Terraces, Xinhua Ziquejie Terraces and Youxi Lianhe Terraces.

Ganzhou City of Jiangxi Province started to build the Hakka culture ecological reserve (in west of Jiangxi Province) in 2006 and set up the Intangible Cultural Heritage Protection Leading Group and Expert Committee. Since the designation of China-NIAHS, the governments of Jiangxi Province and



Chongyi County have attached more importance to the protection of agricultural heritage. They have taken the advice of the experts, organized several seminars and academic exchanges. Commissioners have been sent to visit other sites. In addition, the Chongyi County has designated an organization to prepare for the declaration of globally important agricultural cultural heritage through effective implementation of protection measures and positive publicity after success of the declaration of China's important agricultural heritage.

Since the application of the Longji Terraces for China-NIAHS and GIAHS was initiated, the leaders at all levels of the Longsheng County have paid high attention to the application, and a Leadership Group for the application was set up, with the head of the county as the group director, the deputy head of the county responsible for the heritage application as the vice director, the leaders of various departments of the county related to the application as group members. Application discussion meetings have been held many times, a training class has been offered to acquire the knowledge of agricultural heritage protection, academic conferences or forums on agricultural heritage protection have been participated, the various activities on the theme of agricultural heritage have been involved such as "China Agri-Culture Exhibition" hosted by the Ministry of Agriculture, and the experience of the pilot projects and candidate projects of GIAHS have been drawn for reference.

The government of Xinhua County pays more attention to the protection and development of the Ziquejie terraces by taking it as a major strategic and key area to promote local development and actively applying for all kinds of cultural heritage conservation projects at all levels. In 2004, the Ziquejie Terraces officially entered in the provincial candidate list for World Heritage by Hunan Province. In 2006, it was selected as the first batch of National Natural and Cultural Heritage and also entered in the national candidate list of World Cultural and Natural Heritage. In 2013, it was selected as the first batch of China-NIAHS. In 2014, it was listed in the first batch World Heritage Irrigation Structure. In addition, Xinhua folk songs were selected as the first batch of Intangible Cultural Heritage of Hunan Province in 2006 and the second batch of National Intangible Cultural Heritage of China in 2008. Louxia Village was listed as the second batch of provincial-level historical and cultural village in 2009. Meishan Nuo Opera was selected as third batch of National Intangible Cultural Heritage of China in 2011. Meishan Martial Arts were selected as the fourth batch of National Intangible Cultural Heritage of China in 2014.

## **5.2.2 Huge potentials for the development of eco-products in proposed sites**

The attention on food supply has gradually shifted from food security to the safety of agricultural products, because of increased agricultural production on an industrial scale. The concern of agriculture has also shifted from ensuring adequate supply to providing ecological and quality products, and ultimately to food culture. In overseas and domestic markets, the demands of green ecological products increasingly rise with the changes of the values of consumers. Agricultural heritages have inherent advantages for developing ecological agriculture, because of its high quality traditional rice varieties and good ecological environment.

For example, in Chongyi Hakka Terraces a favorable environment has been created for the production of alpine se-rich organic rice. Although chemical fertilizers and pesticides are common in Chongyi County, a considerable amount of farmyard manure is used in the system. Besides, quite a few

traditional methods are used to control pests and diseases, which safeguard food production.

Longji Pepper, Longsheng Phoenix Chicken, Longsheng Jade Green Duck and Longji Tea have all been certified as China National Agricultural Geographical Indication Products. In addition, the food quality of Longji Terraces is further improved through the extension of high mountain cultivation and breeding and non-pollution cultivation technique. And the technique training to the local farmers have been provided, and various information platforms are employed for to popularize the agricultural technology. The agri-products of Longji Terraces are highlighted by sasanqua, Longji pepper and Longji tea. These products are marketed to the southwestern China, and their quality has been upgraded from popular commodities to non-pollution products, green products and organic products.

The Ziquejie Terraces belongs to the subtropical monsoon climate with sufficient sunlight, warm temperature, abundant rainfalls and humid and moist air. Soil of the Ziquejie Terraces is sandy loam with rich organic matter content, excellent structural condition, and strong permeability. Ziquejie Terraces have rich fracture water in bedrock, mountain springs, and mountain streams, and hold abundant water resources. There are also dense forests and rich biodiversity in the Ziquejie Terraces. All these factors form the suitable environment for the growth of a variety of high quality commercial crops and agricultural crops.

The agricultural products of Lianhe Terrace due to using the green environmental traditional farming skills, scientific landscape structure and brand effects are of a higher market potential. At first, cleanly traditional farming methods are still used by most people for agricultural production, thus farmland environment is better than those farmland's with high chemical inputs. Then, a short water circulation due to rich rainfall and gravity irrigation system in Lianhe Terraces make the farmland have a high self cleaning capacity to ensure cleaner soil and water environment. Besides, the GIAHS management and its brand effects will make agricultural products in Lianhe Terraces have high prices than in other places

### **5.2.3 Huge potentials for the development of eco-tourism in proposed sites**

The economic development of China has entered a new stage. In terms of consumer demands, the consumption of China in the past had obvious imitation wave-features and now it has gradually come to an end. The personalized and diversified consumption has become the mainstream. Agriculture not only has the production function of products like rice, cotton and oil, meat, eggs and other products, but also has important ecological functions and life functions, such as biodiversity conservation, water and soil conservation, climate regulation, leisure and tourism, landscape and recreation, scientific research, cultural heritage and so on. With the development of industrialization and urbanization, the importance of the ecological and life functions of agriculture has become more important and prominent, and brings opportunities for expanding the multi-function development of agricultural heritages.

Chongyi is located in range of the Pearl River Delta economic zone and the Western Taiwan Straits economic zone. This favorable location, together with its ingenious values and features, makes the system ideal for developing rural leisure tourism, which can attract many tourists from surrounding areas. Chongyi has a solid foundation for developing tourism, and the timing is perfect. As a result, tourism surrounding the terraces has become an economic focus of the proposed site, even of the whole county.

As the society progresses, people no longer restrict their understanding of the Longji Terraces in their agricultural value, but regard it as a resource of diversified plant and animal germplasm with the research value in the fields of resource sciences, ecology, environmental sciences, history studies, etc. Besides, with its magnificent and spectacular landscape and its seasonal variations of sceneries, the Longji Terraces allow a touring day of over 300. Moreover, for the past hundreds of years, the Longji Terraces have been blended into the life of the local people in terms of lifestyle, diets, customs, wedding and funeral rites, generating a local culture with strong characteristics. The precious terrace landscape and local culture remains give rise to the unique tourism resource of the Longji Terraces, and with them the rural eco-tourism has earned the Longji terraces an important in the competitive tourism industrial world.

The Ziquejie Terraces is 300km, 280km and 259km from Changsha, Zhuzhou and Xiangtan, respectively. It is 130km, 168km, 255km and 237km from Shaoyang, Huaihua, Hengyang and Yiyang, respectively. All of them are in the transportation range of 3 hours by car and thus become the major sources of tourists to the Ziquejie Terraces. The terraced fields, together with the surrounding scenic spots have formed the complementary tourist routes. All of them formed a complementary portfolio of tourism products that conserved the distinctive characteristics of each tourism resource. This kind of complementary advantage has provided the original impetus for regional tourism development.

In Lianhe Terraces, there are so rich elements that can be used as tourism resources, for example, terraced landscapes, natural landscapes and other various cultures. Among which the regional culture and tourist resources of the proposed site are most special and abundant, including 5 ancient terrace landscapes (like Liannan terrace, Dongbian terrace, Lianyun terrace, Yunshan terrace and Xiayun terrace), 5 scenic spots with natural scenery and cultural landscape (like Jinji Mountain, Alter Rock, Jiufu Mountain), and ancient folk activities about terrace cultivation (“Cattle God Worship Ceremony” and “Crouching Tiger Monk Worship Ceremony”), and Healthy green food culture, such as kumquat, edible fungi and pearl dried bamboo shoots. The cities around like Sanming, Nanping, Putian and Xiamen provide adequate tourist sources for Lianhe Terraces. Besides, the west coast of the Taiwan Straits, Yangtze River Delta and Pearl River Delta are also the potential markets for Lianhe Terraces.

## **5.2.4 Increasing conservation awareness and participation willing of local farmers**

The main force for protecting the system is local farmers, which is why their actions and attitude are crucial for the protection and inheritance of the agriculture of proposed site. Fortunately, they have gradually realized that the land they live on is an invaluable asset, and is the root of their culture.

In-depth interviews with the farmers show that they have come to see the adverse effects of modern chemical agriculture on the ecological environment of Hakka Terraces. In terms of ecological impacts, the farmers are most aware of the implications of high-yield agricultural technologies, represented by chemical technologies, on the land. Their awareness of land resources is the highest. The farmers’ attitude towards protecting the terraces and inheriting the culture has been evaluated by the following indicators: willingness to volunteer, willingness to pay and willingness to work. The result shows that, under neutral conditions, the farmers in general are willing to participate in the protection of the terraces and the inheritance of the culture. Most farmers are against paying for the campaign, saying that the government should be making most of the investment. Meanwhile, most

farmers are willing to volunteer. To sum up, the local farmers have deep feelings about the system, and are willing to protect it. However, they would not undertake more investment due to economic constraints.

Longji terraces are the cultural identity, the habitats and the main livelihood resources of the residents who take measures to protect Longji Terraces as follows: Firstly, they raise the sales price of local agricultural products in order to improve their annual income and living standard. Secondly, they protect the terraced rice production system because it is a heritage for several generations, especially, old local residents have deep affection for the Longji Terraces. Thirdly, the local Zhuang, Yao and other ethnic minority residents expect to enhance their cultural pride by protecting Longji Terraces heritage.

Ziquejie farmers' attitude on the protection and inheritance of rice terrace and its culture was positive and in generally farmers supported development of terrace tourism. Those farmers having strong protection awareness of heritage system were more likely to feel environmental change and conduct ecological protection. Tourism development could promote the protection of terrace. Old farmers and large scale land operator had stronger cognition of terrace system and household with higher education and income were more willing to protect environment.

Since Lianhe Terraces was granted as China-NIAHS, consciousness of protection terraces of farmers in the proposed site is increasing rapidly. More and more farmers began to be aware of the value of traditional farming pattern and participate in the high-quality agricultural production cooperating with enterprises. According to statistical data, totally, the high-quality agricultural production covered a total area of 37,282.2 hectares, with a total yield of 498,828 tons in 2013; and their planting area has reached 51.1%. Therefore, improving of protection consciousness for agricultural heritage is able to ensure GIAHS protection and also to increase farmers' income.

## **5.3 Expected impacts of GIAHS on society and ecology**

### **5.3.1 Impacts on society**

The success of the application for GIAHS will greatly promote the systematic conservation of these rice terraces and will also enhance their popularity to a large extent. It is expected that the GIAHS brand will increase the market value of these rice terraces and attract more enterprises to invest in these terraces and develop their biological and environmental resources. Therefore the industry chain of agriculture and tourism will be extended and more employment positions will be created that help solve the employment of considerable numbers of people. The comprehensive utilization of rich biological resources and the development of green and organic products will greatly enhance the income of local farmers and promote the industrial development of the proposed site. The development of sustainable tourism based on these terraces is expected to bring considerable profits for the proposed site and also to increase the income of the local farmers greatly.

The success of the application for GIAHS will also enhance the cultural consciousness and self-confidence of multi-stakeholders and improve their sense of responsibility on perpetuating the culture and the cohesion of the society. Through scientific investigation and public popularization, on the one hand the local people will have a comprehensive and in-depth understanding of the traditional terrace farming techniques and cultures, thereby possessing a strong sense of pride and belonging; on the other hand the values of these rice terraces and their importance will be revealed to people from



different circles who then will be more interested in their conservation and development. The designation of GIAHS will also make more and more young people feel proud of owning the traditional terraces systems, enabling them to participate in agricultural production, inherit traditional rice cultures and conserve these terraces in an active way.

### **5.3.2 Impacts on ecology**

The success of the application for GIAHS is expected to further promote the conservation of biodiversity especially agro-biodiversity and the local environment in these rice terraces. The development of eco-products including non-pollution products, green products and organic products will on the one hand be beneficial for the conservation of agro-biodiversity and the safeguarding of food security and on the other hand will be beneficial for the maintenance of the good environment of the proposed sites by effectively reducing the use of fertilizer and pesticide, enhancing the cyclic utilization of agricultural waste and conducting compound agricultural production. The systematic conservation of these rice terraces will also be beneficial for the sustainable provision of important ecosystem services, therefore contributing to the maintenance of the good environment of the proposed site.

## **5.4 Motivation of multi-stakeholders**

### **5.4.1 Motivation of local communities**

The rice terraces systems represent the majority of livelihood provisions of the local people. They are also important carriers of traditional farming knowledge, technology and cultures. The local communities therefore have at least two motivations for making these systems become GIAHS and implementing the conservation measures. On one hand, the designation of GIAHS is expected to promote local economy and increase farmers' income. On the other hand, the local people have a strong cultural identity, which makes them willing to pass on their ingenious culture through the terrace system.

In Hakka Terraces, the ingenious clan system of Hakka can be made use of to attract the local community to participate in the initiative. For example, new self-help groups can be set up, such as an association of agricultural and bamboo craft processing. Another example is inviting existing owners of agri-entertainment businesses to found an industrial association. In Ziquejie Terraces, local farmers are positive and active in the conservation of terraced fields, hoping to increase their income, pass on the traditional knowledge and technologies to the young generation, enhancing their sense of cultural pride and attracting more people to come back to participate in the agricultural production. In Longji Terraces, local villagers especially young generation are very active to learn traditional knowledge and traditional culture, focus on the development of agri-products with strong characteristics, participate in tourism development, establish the village autonomy institution and participate in language training class to learn modern knowledge and technologies. Local communities in Lianhe Terraces are also positive in the conservation of terraced fields by adopting clean production approaches, continuing cultural activities for inheritance, enlarging the area of symbiotic patterns and working on traditional

handicraft production with tourism development.

### **5.4.2 Motivation of local authorities**

Eco-product and eco-tourism development in these rice terraces will inevitably involve the conservation of traditional culture, the use of land resources, the maintenance of biodiversity, and many other issues. Those problems require the local governments to promote the integration and intensive use of land resources by laws, policy, institution and planning.

There are lots of reasons for the local governments to actively get involved in the development and conservation of heritage systems. At first, the traditional farming culture and modernized business operations require the community residents to vigorously cooperate with the government since the government has great advantages in terms of administrative organization. The government will guide the modernization transformation of agricultural production and life styles of farmers by community building and to cultivate the agricultural heritage protection awareness among residents so as to ensure their initiative participation in tourism development. In the early stages of tourism development, the government will actively promote the institutional innovation of cultural tourism enterprises, and promote restructuring of the cultural tourism enterprises for the formation of cultural tourism corporations with high brand effects.

Secondly, the government has an overall development perspective. They are taking the sustainable development of agricultural heritage and increase of the income of local farmers as core objectives. Their neutral authority in the distribution of benefits and disputes of benefit will enhance the confidence degree of enterprises and residents in the government.

Finally, the government hopes to achieve sustainable development of the proposed site through the effective protection of traditional cultural and biological diversity. Specialized teams have been established to excavate the cultural values of traditional agriculture. Series academic research conferences have been held. In some rice terraces system, the traditional farming culture museum has been constructed under the guide of the local government, which has effectively promoted the inheritance of agricultural heritages.

### **5.4.3 Motivation of national authorities**

In recent years, the Chinese government and relevant departments have attached more importance to the protection and inheritance of agricultural heritages. They believe that the protection of agricultural heritage is conducive to sustainable development and try to incorporate the protection of agricultural heritage into the strategy of ecological civilization construction, beautiful countryside construction, environmental protection and cultural industry development. Its support includes regulations, policies and project funding. In 2012 the Ministry of Agriculture started the China-NIAHS initiative and has selected a total of 91 China-NIAHS till now. The central government has made a clear-cut requirement on the conservation and management of agricultural heritage systems that is to promote sustainable development without sacrificing the environment, and to increase farmers' income through multiple channels, such as leisure agriculture and rural tourism that give full play to the multiple functions of agriculture. The high attention paid by the Chinese government and relevant departments provides a good opportunity for the conservation and development of these rice terraces as

agricultural heritage systems.

## **5.4.4 Motivation of other relevant stakeholders**

### **(1) Enterprises**

Currently most agricultural products of the proposed sites are sold by the enterprises. Lacking prominent brand features, the potentials of the system's agricultural products have not been fully developed. Thus local enterprises and farmer cooperatives hope that the GIAHS initiative will promote local brands to increase the added value of their products. In terms of the cooperation mechanisms, on the one hand the enterprises will cooperate with local farmers and farmer cooperatives to establish collaborative production modes. On the other hand, government policy and funding will be actively applied for supporting these collaborative modes. Besides, with the development of proposed site tourism, related enterprise, associations, cooperatives can work together to explore the landscapes, food, traditional culture and entertainments, so as to attract tourists with sensitive ecological and cultural interests.

Take Lianhe Terraces as an example. The local enterprises showed positiveness in developing traditional clean production. For example, in 2013 there were 18 enterprises producing 21 kinds of nuisance free agricultural products, 11 certified enterprises producing 21 kinds of green products, 2 enterprises producing 24 kinds of organic food. Totally, there were 31 enterprises producing 65 kinds of products in 2013 when Lianhe Terraces were granted as China-NIAHS. In addition, many enterprises train the local farmers how to farm ecologically and propagandize the heritage brand of Lianhe Terraces to improve the protection consciousness and its commercial value.

Eight agricultural enterprises were set up in Ziquejie Terraces and some of their products have already been certified as national organic, green, or geographical identification products. Brands of local specialized agricultural products with higher added value were established for the traditional high quality purple rice, black rice and red rice. Enterprises or cooperatives were taken as the main players in the certification of pollution-free, green, organic or geographical indication agricultural products. In addition, "Xinhua County Cultural Tourism Investment Co., Ltd." was established to strengthen the overall tourism promotional activities, and organize travel and tourism festival promotions, so as to continuously expand the influence of the Ziquejie Terraces. Enterprises related to agricultural products and tourism in the Ziquejie Terraces all hope that their products could enjoy higher value with the help of GIAHS. In that case, their product value and popularity will be enhanced and economic output could be increased, so as to realize long term development of these enterprises.

### **(2) Media**

Media can also play a very important role in the conservation of these rice terraces as heritage systems. For example, the government of Longsheng County cooperated with the tourism company to make an advertisement in the social media to propagandize the Longji Terraces and its traditional rice culture that have enhanced the popularity of Longji Terraces at home and abroad. The government also cooperated with relevant agencies and media to carry out some activities, such as holding photography

competitions, making a film and television, inviting the media to film the process of local traditional agricultural activities and customs rituals and then put them on the Internet.

As a precious agricultural heritage, many different kinds of media have participated in propagandizing Lianhe Terraces. In February 2015, the column group of CCTV7 went to Lianhe Terraces and shot the feature programme of “*Fujian Youxi Lianhe Terraces*” to introduce their life styles and customs to the world through TV. In January 2017, the News Center of Fujian Radio Film and TV Group held “*a special report for villages in New Year*” in Guifeng Village to report the folk activity of Lianhe Terraces. This report was broadcasted by CCTV NEWS channel and CCTV International channel. In addition, Lianhe Terraces also attracted some film crews to find views. Participation of various media has promoted the effective conservation of Lianhe Terraces.

### **(3) Tourists**

Tourists can also play an important role in the conservation of these rice terraces systems. For example, Ziquejie Terraces, as the cultural and historical relics that integrated the southern rice cultivation culture and the fishing and hunting culture of Miao and Yao ethnic groups, have attracted countless tourists to come to enjoy their beauty and admire their large scope and delicate shape. Visitors wish the Ziquejie Terraces to be well conserved since they would like to appreciate the splendid and unique view, to experience the unique traditional farming culture, to taste the delicious food, and to sense the elegant charms of its ancient civilization. Another example is from Hakka Terraces that demonstrates that tourists do not only admire the remarkable landscapes, but also experience farming as well as the food culture. After nine-layered cake, a cuisine of Shangbao, and the Hakka Terraces were shown in several TV shows such as *A Bite of China* and *Hakka Footprint*, many tourists have been attracted to come to visit Shangbao Township that is located in Chongyi Hakka Terraces. Many professional photographers have also been attracted to the proposed site.



# Annex 1 The list of biodiversity in Chongyi Hakka Terraces

## 1 Agricultural Biodiversity

### 1.1 Crop resources

Schedule 1-1 Traditional rice varieties in Chongyi Hakka Terraces

Number	Local varieties Name	Number	Local varieties Name
1	<i>Oryza sativa</i> 'Nantehao'	8	<i>Oryza sativa</i> 'yellow husk glutinous rice'
2	<i>Oryza sativa</i> 'Lucaihao'	9	<i>Oryza sativa</i> 'black rice'
3	<i>Oryza sativa</i> 'Bairizao'	10	<i>Oryza sativa</i> 'Mazhan glutinous rice'
4	<i>Oryza sativa</i> 'Changyaozao'	11	<i>Oryza sativa</i> 'dahezi rice'
5	<i>Oryza sativa</i> 'pearl short rice'	12	<i>Oryza sativa</i> 'sorghum glutinous rice'
6	<i>Oryza sativa</i> 'short-legged nantehao rice'	13	<i>Oryza sativa</i> 'short-legged Dahe rice'
7	<i>Oryza sativa</i> 'red rice'		

Schedule 1-2 Hybrid rice varieties in Chongyi Hakka Terraces

Number	Germplasm type	Local Varieties Name(Latin Name)
1	Aiyou series	<i>Oryza sativa</i> 'Aiyou2hao'
2		<i>Oryza sativa</i> 'Aiyou3hao'
3		<i>Oryza sativa</i> 'Aiyou6hao'
4	Nanyou series	<i>Oryza sativa</i> 'Nanyou2hao'
5		<i>Oryza sativa</i> 'Nanyou3hao'
6		<i>Oryza sativa</i> 'Nanyou6hao'
7	Weiyou series	<i>Oryza sativa</i> 'Weiyou2hao'
8		<i>Oryza sativa</i> 'Weiyou3hao'
9		<i>Oryza sativa</i> 'Weiyou6hao'
10		<i>Oryza sativa</i> 'Weiyou8hao'
11		<i>Oryza sativa</i> 'Weiyou8hao'
12	Siyou series	<i>Oryza sativa</i> 'Siyou2hao'
13		<i>Oryza sativa</i> 'Siyou3hao'
14		<i>Oryza sativa</i> 'Siyou4hao'
15		<i>Oryza sativa</i> 'Siyou6hao'
16	Shanyou series	<i>Oryza sativa</i> 'Shanyou2hao'
17		<i>Oryza sativa</i> 'Shanyou3hao'
18		<i>Oryza sativa</i> 'Shanyou4hao'
19		<i>Oryza sativa</i> 'Shanyou6hao'

Number	Germplasm type	Local Varieties Name(Latin Name)
20		<i>Oryza sativa</i> 'Shanyou8hao'
21		<i>Oryza sativa</i> 'Shanyou63'
22	75P-12 series	<i>Oryza sativa</i> 'WeiA×75P-12'
23		<i>Oryza sativa</i> 'NanA×75P-12'
24	Kezhen145 series	<i>Oryza sativa</i> 'ShanA×Kezhen145'
25	The other series	<i>Oryza sativa</i> 'Ilyou58'
26		<i>Oryza sativa</i> 'Ilyouming86'
27		<i>Oryza sativa</i> 'Ilyou906'
28		<i>Oryza sativa</i> 'Fengliangyou1hao'
29		<i>Oryza sativa</i> 'Teyou70'
30		<i>Oryza sativa</i> 'Shanyou122'
31		<i>Oryza sativa</i> 'Liangyoupeijiu'
32		<i>Oryza sativa</i> 'Zhongyou253'
33		<i>Oryza sativa</i> 'Shanyou82'
34		<i>Oryza sativa</i> 'Ilyou46'
35		<i>Oryza sativa</i> 'Shanyou46'
36		<i>Oryza sativa</i> 'Ilyou441'
37		<i>Oryza sativa</i> 'Ilyou1273'
38		<i>Oryza sativa</i> 'Qingjiang1hao'
39		<i>Oryza sativa</i> 'Ilyouhang1hao'
40		<i>Oryza sativa</i> 'Guodao1hao'
41		<i>Oryza sativa</i> 'Guodao4hao'
42		<i>Oryza sativa</i> 'Ilyou416'
43		<i>Oryza sativa</i> 'Weiliangyou527'
44		<i>Oryza sativa</i> 'Dyou527'
45		<i>Oryza sativa</i> 'xianong2hao'
46		<i>Oryza sativa</i> 'jinyou207'
47		<i>Oryza sativa</i> 'jinguiyou99'
48		<i>Oryza sativa</i> 'feiyou98'
49		<i>Oryza sativa</i> 'denong2000'
50		<i>Oryza sativa</i> 'denong316'
51		<i>Oryza sativa</i> 'ganxin203'
52		<i>Oryza sativa</i> 'luliangyou996'
53		<i>Oryza sativa</i> 'eyou2hao'
54		<i>Oryza sativa</i> 'Tyou898'
55		<i>Oryza sativa</i> 'nongyou1506'
56		<i>Oryza sativa</i> 'shenliangyou5814'
57		<i>Oryza sativa</i> 'peiliangyou288'
58	<i>Oryza sativa</i> 'tianyoun3301'	
59	<i>Oryza sativa</i> 'nei5you 8015'	
60	<i>Oryza sativa</i> 'Yliangyou 1hao'	
61	<i>Oryza sativa</i> 'yueyou108'	

Number	Germplasm type	Local Varieties Name(Latin Name)
62		<i>Oryza sativa</i> 'jinyou463'
63		<i>Oryza sativa</i> 'Tyou5128'
64		<i>Oryza sativa</i> 'wufengyouT025'
65		<i>Oryza sativa</i> 'nongyou225'
66		<i>Oryza sativa</i> 'jiayou1251'
67		<i>Oryza sativa</i> 'tianfengyou19'
68		<i>Oryza sativa</i> 'wuyou308'
69		<i>Oryza sativa</i> 'xieyouzhou282'
70		<i>Oryza sativa</i> 'xinrongyou254'
71		<i>Oryza sativa</i> 'xinrongyou2260'
72		<i>Oryza sativa</i> 'qianliangyou2180'
73		<i>Oryza sativa</i> 'fengyuanyou2297'
74		<i>Oryza sativa</i> 'ganxin688'
75		<i>Oryza sativa</i> 'taiyou99'
76		<i>Oryza sativa</i> 'shenliangyou5814'
77		<i>Oryza sativa</i> 'teyou627'

#### Schedule 1-3 The other crop resources

No	Germplasm type	Detailed Type	Local Varieties Name (Latin Name)	
1	The other food crops	Yam	<i>Solanum tuberosum</i>	
2		Corn	<i>Super sweet corn</i>	
3		Sorghum	See Schedule 1-2	
4		Triticites	See Schedule 1-2	
5		Millet	See Schedule 1-2	
6		Bean		<i>Glycine max (Linn.) Merrx</i>
7				<i>Glycine Willd 'Qingpidou'</i>
8				<i>Lablab purpureus (Linn.)Sweet</i>
9				<i>Glycinemax(L.)merr</i>
10				<i>Glycine Willd 'Bairendou'</i>
11				<i>Vigna umbellata (Thunb.) Ohwi et Ohashi</i>
12	Fibre crops	Hemp fiber	See Schedule 1-2	
13		Cotton		<i>Gossypium 'Humian204'</i>
14				<i>Gossypium 'Bomian2hao'</i>
15				<i>Gossypium 'Daizi15hao'</i>
16				<i>Gossypium 'Eguangmian'</i>
17				<i>Gossypium 'chicken feet cotton'</i>
18				<i>Gossypium 'the long-staple cotton'</i>
19	Oil crops	Oil seed rape	<i>Brassica rapa (campestris) L</i>	
20			<i>Brassica napus L</i>	
21		Sesame	<i>Semen Sesami Nigrum</i>	
22			<i>Sesamum indicum L</i>	
23			Tea-oil tree	<i>Camellia oleifera Abel</i>

No	Germplasm type	Detailed Type	Local Varieties Name (Latin Name)
24		Peanut	<i>Arachis 'Yuenanhong'</i>
25			<i>Arachis 'Yuexuan58'</i>
26			<i>Arachis 'Liuyuebao'</i>
27	Sugar-yielding crop	Sugarcane	<i>Saccharum sinense</i>
28			<i>Yellow fruit cane</i>
29	Stimulant crop	Tobacco	<i>Nicotiana tabacum L</i>
30	Vegetables	Chinese cabbage vegetables	<i>Brassica chinensis L</i>
31			<i>Brassica rapa chinensis</i>
32			<i>Brassicachinensis L</i>
33			<i>Brassica camperstris ssp.pekinens</i>
34			<i>Brassica rapa pekinensis</i>
35		Root vegetables	<i>White Radish</i>
36			<i>Daucus carota</i>
37			<i>Brassica juncea var</i>
38			<i>Zingiber officinale Roscoe</i>
39		Solanaceous vegetables	<i>Lycopersicon esculentum Mill</i>
40			<i>solanum melongena</i>
41			<i>Capsicum annuum L</i>
42		Melons vegetables	<i>Cucumis sativus Linn</i>
43			<i>Balsam pear</i>
44			<i>Benincasa hispida (Thunb.) Cogn</i>
44			<i>Benincasa hispida (Thunb.) Cogn. var. chieh-qua How</i>
45			<i>Cucurbita moschata (Duch. ex Lam.) Duch. ex Poiret</i>
46			<i>Luffa cylindrica</i>
47			<i>Cucurbita pepo L</i>
48		Kale vegetables	<i>Brassica oleracea var. capitata</i>
49			<i>Brassica oleracea L. var. botrytis L</i>
50			<i>Brassica alboglabra L. H. Bailey</i>
51		Legume vegetables	<i>Pisum sativum L</i>
52			<i>Lablab purpureus (Linn.) Sweet</i>
53			<i>Leguminosae</i>
54			<i>Vigna unguiculata</i>
55			<i>Vigna Savi 'Siyuemei'</i>
56			<i>Vigna Savi 'Dongmei'</i>
57	Green leafy vegetables	<i>Spinacia oleracea L</i>	
58		<i>Lactuca sativa</i>	
59		<i>Amaranthus tricolor</i>	
60		<i>Graveolens</i>	
61		<i>Foeniculum vulgare</i>	
62		<i>Brassica chinensis var chinensis</i>	
63		<i>megarrhiza Tsen et Lee</i>	
64		<i>Capsella bursa-pastoris</i>	

No	Germplasm type	Detailed Type	Local Varieties Name (Latin Name)
65		Tuber vegetables	<i>Solanum tuberosum</i>
66			<i>Colocasia esculenta (L) .Schott</i>
67			<i>Colocasia esculenta</i>
68		Onion garlic vegetables	<i>Allium porrum</i>
69			<i>Allium fistulosum L.var. giganteum Makion</i>
70			<i>Allium sativum L</i>
71			<i>Alliaceae 'Seasons garlic'</i>
72			<i>Allium cepa</i>
73			<i>A. tuberosum Rottl. ex Spreng</i>
74			<i>Allium chinense G.Don</i>
75		Aquatic vegetables	<i>Nelumbo nucifera G</i>
76			<i>Ipomoea aquatica Forsk</i>
77			<i>Zizania latifolia (Griseb.) Stapf</i>
78	Fruit and tea	Fruits	<i>Citrus reticulata Blanc</i>
79			<i>Citrus reticulata Blanco cv. Ponkan</i>
80			Navel orange( <i>Citrus sinensis Osbeck</i> )
81			<i>Pyrus spp</i>
82			<i>Amygdalus persica L</i>
83			<i>Prunus salicina Lindl</i>
84			<i>Choerospondias Axillaris.</i>
85			<i>Prunus armeniaca</i>
86			<i>Myrica rubra (Lour.) S. et Zucc</i>
87			<i>Diospyros kaki Thunb</i>
88			<i>Castanea mollissima</i>
89			<i>Vitis vinifera</i>
90			<i>Vitis davidii</i>
91			Loquat ( <i>Eriobotrya japonica (Thunb.) Lindl</i> )
92			<i>Citrus maxima</i>
93			<i>Actinidia Chinensis</i>
94			<i>Crataegus pinnatifida Bunge</i>
95			<i>Punica granatum L</i>
96			<i>Heleocharis dulcis (Burm. f.) Trin</i>
97			Tea
98	<i>Fuding white tea</i>		
99	<i>Shangmeizhou</i>		
100	<i>Yunnan Camellia assamica var. Bitter tea</i>		
101	<i>Shangraodamianbai</i>		
102	<i>Fuyun</i>		
103	<i>Jianghua Camellia assamica var. tea</i>		
104	<i>Yangling xiumei tea</i>		
105	<i>Niedu Camellia assamica var. Bitter tea</i>		
106	<i>Longgui tea</i>		



No	Germplasm type	Detailed Type	Local Varieties Name (Latin Name)
107	green manure crops		<i>Astragalus sinicus</i>
108			<i>Raphanus sativus L</i>
109			<i>Brassica campestris L</i>

#### Schedule 1-4 The other traditional crop resources

Number	Detailed Type	Local Varieties Name(Latin Name)	
1	Potato	<i>Sweet potato</i>	
2		<i>Ipomoea batatas</i>	
3		<i>Potato crop 'Huaxinshu'</i>	
4	Traditional corn	<i>Zea mays 'Traditional corn'</i>	
5	Sorghum	<i>Sorghum 'Gaogan Chinese sorghum'</i>	
6		<i>Sorghum 'Aigan Chinese sorghum'</i>	
7	Triticites	Barley	<i>Hordeum vulgare L</i>
8		Wheat	<i>Triticum aestivumLinn</i>
9		Buckwheat	<i>Fagopyrum esculentum Moench</i>
10	Millet	Indica yellow millet	<i>Setaria Beauv 'indica-rice yellow millet'</i>
11		Glutinous rice millet	<i>Setaria Beauv 'Glutinous millet'</i>
12		Chicken feet millet	<i>Setaria Beauv 'chicken-feet millet'</i>
13		Dog tail millet	<i>Setaria italica(L.) Beauv</i>
14		Yellow millet	<i>Panicum miliaceum L</i>
15	Hemp fibers	China grass	<i>Boehmeria nivea (L.) Gaudich.</i>
16		Jute	<i>Corchorus capsularis L</i>
17	Local peanut	<i>Traditional Arachis hypogaea Linn</i>	
18	Konjak	<i>Amorphophallus rivieri</i>	
19	Bottle gourd	<i>Lagenaria siceraria var.hispida</i>	
20	Yam beam	<i>Pachyrhizus erosus</i>	
21	Chayote	<i>Sechium edule</i>	
22	Ipomoea aquatic	<i>Ipomoea aquatica Forssk</i>	
23	Gynura bicolor	<i>Begonia fimbristipulata</i>	
24	Sweet tea	<i>Leaf of Strigose Hydrangea</i>	
25	Bitter tea	<i>Mallotus oblongifolius</i>	
26	arbor wild tea	<i>Tea 'arbor Wild tea'</i>	

## 1.2 Animal husbandry and fishery resources

#### Schedule 1-5 Varieties of animal husbandry and fishery resources

No	Germplasm Type	Detailed Type	Local Varieties Name (Latin Name)
1	Husbandry resources	Pig	<i>Sus scrofa 'Yushan pig'</i>
2			<i>Yorkshire</i>
3			<i>Berkshire pig</i>
4			<i>Landrace</i>

No	Germplasm Type	Detailed Type	Local Varieties Name (Latin Name)
5			<i>Sus scrofa</i> 'Subai pig'
6			<i>Sus scrofa</i> 'Ningxiangshire'
7			<i>Duroc</i>
8			<i>Ganbai</i> sows
9			<i>Large Yorkshire</i> crosses
10		Cow	<i>Guizhou huagang</i> cattle
11			<i>Holstein</i> cattle
12			<i>Crossbreed</i> cattle
13		Rabbit	<i>Angora</i> Rabbit
14			<i>West germany</i> Rabbit
15			<i>Japanses white</i>
16			<i>Crossbreed</i> Rabbit
17			<i>Long hair</i> Rabbit
18			<i>Conymeat</i> rabbit
19		Goat	<i>Xinjiang fine wool</i> sheep
20			<i>Caucasian Merino</i>
21			<i>Shanxi milk-producing</i> goats
22			<i>Chengdu grey</i> goat
23			<i>Henan jilt the</i> lamb
24			<i>Grey</i> goat
25			<i>Wanzai</i> goat
26			<i>Yichun</i> goat
27			<i>Black</i> goat
28		Dog	<i>Poodles</i> dog
29			<i>Hound</i>
30			<i>Saarloos</i>
31			<i>Patrol</i> dog
32		Cat	<i>Felinae</i>
33			<i>Black</i> cat
34			<i>Gray</i> cat
35		Chicken	<i>Numididae</i> guinea fowl
36			<i>Black</i> chicken
37			<i>Phasianus colchicus</i> Linnaeus
38			<i>Rose</i> Chick
39		Duck	<i>Oxyura vittata</i>
40			<i>Aromatic</i> duck
41			<i>Peking</i> duck
42			<i>Jinding</i> egg duck
43			<i>Shaoxing</i> egg duck
44			<i>Crossbreed</i> duck
45			<i>Big sheldrake</i>

No	Germplasm Type	Detailed Type	Local Varieties Name (Latin Name)	
46			<i>Cherry Valley ducks</i>	
47			<i>Xingguo grey duck</i>	
48			Goose	<i>Lion Head Geese</i>
49				<i>Black brown goose</i>
50		Pigeon	<i>White Pigeon</i>	
51			<i>Gray Pigeon</i>	
52			<i>Black pigeon</i>	
53			<i>Royal Homing Pigeon</i>	
54		Bee	<i>Apis mellifera Ligustica Spinola</i>	
55		Fishery resources	Fishes	<i>Cyprinus carpio</i>
56	<i>Inpaichthys kerri</i>			
57	<i>Carassius auratus</i>			
58	<i>Stone crucian</i>			
59	<i>Carassius auratus cuvieri Temminck et Schlegel</i>			
60	<i>Pengze crucian</i>			
61	<i>Mylopharyngodon piceus</i>			
62	<i>Ctenopharyngodon idellus</i>			
63	<i>Hypophthalmichthys molitrix</i>			
64	<i>Hypophthalmichthys nobilis</i>			
65	<i>Gutoufang fish</i>			
66	<i>Magalobrama Tarminalis (Richardson)</i>			
67	<i>Erythroculter Ilishaeformis</i>			
68	<i>Rhodeus sinensis Gunther</i>			
69	<i>Wuyuan pouch red carp</i>			
70	Siluridae			<i>Silurus asotus</i>
71	Cobitidae			<i>Misgurnus anguillicaudatus (Cantor)</i>
72	Synbranchih ae			<i>Monopterus albus</i>
73	Clariidae			<i>Clarias fuscus</i>
74			<i>Ge Clarias fuscus</i>	
75	Bagridae		<i>Pelteobagrus fulvidraco</i>	
76			<i>Leiocassis longirostris</i>	
77	Serranidae		<i>Epinephelus sp</i>	
78			<i>Siniperca chuatsi</i>	
79	Gobiidae		<i>Ctenogobius giurinus</i>	
80	Cichlidae		<i>Oreochromis spp</i>	
81			<i>Tilapia nilotica (linnaeus)</i>	
82			<i>Red Tilmpa</i>	
83	Reptiles		<i>Trionyx sinensis</i>	
84			<i>Rana catesbeiana</i>	
85			<i>Rana grylio</i>	
86	Crustaceans		<i>Macrobrachium nipponense</i>	

No	Germplasm Type	Detailed Type	Local Varieties Name (Latin Name)
87			<i>Palaemonetes sinensis</i>
88			<i>Potamidae</i>
89		Shell-fish	<i>Corbicula fluminea</i>
90			<i>Procambarus clarkii</i>

#### Schedule 1-6 The traditional domesticate animal

Number	Local Varieties Name	Latin Name
1	Traditional chicken	<i>Gallus 'Traditional Gallus gallus'</i>
2	Traditional duck	<i>Anas 'Traditional ducks anatidae'</i>
3	Traditional goose	<i>Anser 'Traditional goose'</i>
4	Traditional gray pigeon	<i>Traditional columba</i>
5	Traditional cat	<i>Traditional Felinae</i>
6	Local yellow dog	<i>Canis lupus familiaris 'local yellow dog'</i>
7	traditional spotted pig	<i>Sus scrofa 'traditional spotted pig'</i>
8	Shangyou pig	<i>Sus scrofa 'Shangyou pig'</i>
9	Ganzhou pig	<i>Sus scrofa 'Ganzhou white pig'</i>
10	Buffaloes	<i>Traditional bubalus</i>
11	Yellow cattle	<i>Traditional Catullus</i>
12	Traditional goat	<i>Traditional Capra</i>
13	Traditional rabbit	<i>Traditional Leporidae</i>
14	Local bee	<i>Apis cerana cerana Fabricius</i>

## 2 Agriculture-related biodiversity

### 2.1 Wild plant resources

#### Schedule 2-1 National key protected wild plant species

Number	Species	Family	Level of Protection
1	<i>Bretschneidera sinensis</i>	<i>Bretschneideraceae</i>	I
2	<i>Ginkgo biloba L</i>	<i>Ginkgoaceae</i>	I
3	<i>Taxus mairei (lemeret et Lévl) S Y Hu</i>	<i>Taxaceae</i>	I
4	<i>Alsophila mertteniana</i>	<i>Cyatheaceae</i>	II
5	<i>Cinnamomum rigidissimum</i>	<i>Lauraceae</i>	II
6	<i>Castanopsis concinna</i>	<i>Fagaceae</i>	II
7	<i>Fagopyrum dibotrys</i>	<i>Polygonaceae</i>	II
8	<i>Fokienia hodginsii</i>	<i>Cupressaceae</i>	II
9	<i>Cinnamomum camphora</i>	<i>Lauraceae</i>	II
10	<i>Magnolia officinalis subsp. biloba</i>	<i>Magnoliaceae</i>	II
11	<i>Toona ciliata var. pubescens</i>	<i>Meliaceae</i>	II

Number	Species	Family	Level of Protection
12	<i>Camptotheca acuminata</i> Decne	<i>Nyssaceae</i>	II
13	<i>Glycine soja</i> .	<i>Papilionaceae</i>	II
14	<i>Semiliquidambar cathayensis</i>	<i>Hamamelidaceae</i>	II
15	<i>Phellodendron chinense</i> var. <i>glabriusculum</i>	<i>Rutaceae</i>	II
16	<i>Eurycorymbus cavaleriei</i>	<i>Sapindaceae</i>	II
17	<i>Cibotium barometze</i>	<i>Dicksoniaceae</i>	II

**Schedule 2-2 Species recorded in China Plant Red Data Book**

Number	Species	Family	Level of Protection
1	<i>Fokienia hodginsii</i>	<i>Cupressaceae</i>	vulnerable
2	<i>Tsuga chinensis</i> var. <i>tchekiangensis</i>	<i>Pinaceae</i>	vulnerable
3	<i>Tsuga longibracteata</i>	<i>Pinaceae</i>	vulnerable
4	<i>Parakmeria lotungensis</i>	<i>Magnoliaceae</i>	vulnerable
5	<i>Tsoongiodendron odorum</i>	<i>Magnoliaceae</i>	rare
6	<i>Cinnamomun micranthum</i>	<i>Lauraceae</i>	vulnerable
7	<i>Coptis chinensis</i> var. <i>brevisepala</i>	<i>Ranunculaceae</i>	vulnerable
8	<i>Dysosma versipellis</i>	<i>Berberidaceae</i>	vulnerable
9	<i>Glycine soja</i>	<i>Papilionaceae</i>	vulnerable
10	<i>Semiliquidambar cathayensis</i>	<i>Hamamelidaceae</i>	rare
11	<i>Castanopsis concinna</i>	<i>Fagaceae</i>	endangered
12	<i>Castanopsis kawakamii</i>	<i>Fagaceae</i>	rare
13	<i>Artocarpus hypargyreus</i>	<i>Moraceae</i>	rare
14	<i>Phellodendron chinense</i> var. <i>glabriusculum</i>	<i>Rutaceae</i>	vulnerable
15	<i>Eurycorymbus cavaleriei</i>	<i>Sapindaceae</i>	rare
16	<i>Bretschneidera sinensis</i>	<i>Bretschneideraceae</i>	rare
17	<i>Tapiscia sinensis</i>	<i>Staphyleaceae</i>	rare
18	<i>Halesia macgregorii</i>	<i>Styracaceae</i>	rare
19	<i>Changnienia amoena</i>	<i>Orchidaceae</i>	rare
20	<i>Pteroceltis tatarinowii</i>	<i>Ulmaceae</i>	rare

**Schedule 2-3 Species listed into the Appendix II of CITES(2007)**

Number	Species	Family
1	<i>Cibotium barometze</i>	<i>Dicksoniaceae</i>
2	<i>Taxus mairei</i>	<i>Taxaceae</i>
3	<i>Amitostigma gracile</i>	<i>Orchidaceae</i>
4	<i>Arundina graminifolia</i> (D. Don) Hochr	<i>Orchidaceae</i>
5	<i>Anoectochilus roxburghii</i>	<i>Orchidaceae</i>
6	<i>Bletilla striata</i> (Thunb.) Rchb. f	<i>Orchidaceae</i>



Number	Species	Family
7	<i>Bulbophyllum inconspicuum</i> Maxim	Orchidaceae
8	<i>B. kwangtungense</i> Schltr	Orchidaceae
9	<i>B. pectenvenensis</i>	Orchidaceae
10	<i>Collabium chinensis</i>	Orchidaceae
11	<i>Calanthe densiflora</i> Lindl	Orchidaceae
12	<i>C. alismaefolia</i>	Orchidaceae
13	<i>C. discolor</i> Lindl	Orchidaceae
14	<i>C. graciliflora</i> Hayata	Orchidaceae
15	<i>C. gracilis</i> Lindl	Orchidaceae
16	<i>C. masuca</i> (D. Don) Lindl	Orchidaceae
17	<i>Cleisostoma paniculatum</i>	Orchidaceae
18	<i>C. tsoongiana</i> Tang et Wang	Orchidaceae
19	<i>Cephalanthera erecta</i> (Thunb.) Bl	Orchidaceae
20	<i>C. falcata</i> (Thunb.) Lindl	Orchidaceae
21	<i>Changnienia amoena</i> Chien	Orchidaceae
22	<i>Coelogyne fimbriata</i> Lindl	Orchidaceae
23	<i>Cymbidium ensifolium</i> (L.) Sw	Orchidaceae
24	<i>C. faberi</i> Rolfe	Orchidaceae
25	<i>C. floribundum</i> Lindl	Orchidaceae
26	<i>C. formosanum</i>	Orchidaceae
27	<i>C. floribundum</i> var. <i>pumilum</i>	Orchidaceae
28	<i>C. goeringii</i> (Rchb. f.) Rchb. f	Orchidaceae
29	<i>C. kanran</i> Makino	Orchidaceae
30	<i>C. lancifolium</i> Hook	Orchidaceae
31	<i>Dendrobium moniliforme</i> (L.) Sw	Orchidaceae
32	<i>D. nobile</i> Lindl	Orchidaceae
33	<i>Dendrobium lohohense</i>	Orchidaceae
34	<i>D. wilsonii</i>	Orchidaceae
35	<i>Eulophia campestris</i>	Orchidaceae
36	<i>Epigeneium fargesii</i> (Finet.) Gagnep	Orchidaceae
37	<i>Epipactis thunbergii</i> A. Gray	Orchidaceae
38	<i>Eulophia sinensis</i> Miq	Orchidaceae
39	<i>Galeola faberi</i> Rolfe	Orchidaceae
40	<i>Goodyera biflora</i> (Lindl.) Hook. f	Orchidaceae
41	<i>G. foliosa</i> (Lindl.) Benth. ex Clarke	Orchidaceae
42	<i>G. henryi</i> Rolfe	Orchidaceae
43	<i>G. repens</i> (L.) R. Br	Orchidaceae
44	<i>G. schlechtendaliana</i> Rchb. f	Orchidaceae

Number	Species	Family
45	<i>Habenaria ciliolaris</i> (L.) Krianzl	Orchidaceae
46	<i>H. dentata</i> (Sw.) Schltr	Orchidaceae
47	<i>H. fordii</i> Rolfe	Orchidaceae
48	<i>H. hystrix</i> Ames	Orchidaceae
49	<i>H. petelotii</i> Gagnep	Orchidaceae
50	<i>H. rhodocheila</i> Hance	Orchidaceae
51	<i>Herminium lanceum</i> (Thunb.) Vuijk	Orchidaceae
52	<i>Liparis bootanensis</i>	Orchidaceae
53	<i>Liparis inaperta</i> Finet	Orchidaceae
54	<i>L. nervosa</i> (Thunb.) Lindl	Orchidaceae
55	<i>L. odorata</i> (Willd.) Lindl	Orchidaceae
56	<i>L. pauliana</i> Hand.-Mazz	Orchidaceae
57	<i>L. petiolata</i> (D. Don) Hunt et Summerh	Orchidaceae
58	<i>Malaxis microtatantha</i>	Orchidaceae
59	<i>Microtis unifolia</i> (Forst.) Rchb. f	Orchidaceae
60	<i>Nothodoritis zhejiangensis</i> Tsi	Orchidaceae
61	<i>Oberonia japonica</i> (Maxim.) Makino	Orchidaceae
62	<i>Oberonia iridifolia</i>	Orchidaceae
63	<i>Peristylus goodyeroides</i> (D. Don) Lindl.	Orchidaceae
64	<i>Phaius flavus</i> (Bl.) Lindl	Orchidaceae
65	<i>P. formosana</i>	Orchidaceae
66	<i>Ph. tankervilleae</i> (Banks ex L'Herit.) Bl	Orchidaceae
67	<i>Pholidota chinensis</i> Lindl	Orchidaceae
68	<i>Platanthera minor</i> (Miq.) Rchb. f	Orchidaceae
69	<i>P. tipuloides</i> (L.) Lindl	Orchidaceae
70	<i>Pleione bulbocodioides</i> (Franch.) Rolfe	Orchidaceae
71	<i>Spathoglottis pubescens</i> Lindl	Orchidaceae
72	<i>Spiranthes sinensis</i> (Pers.) Ames	Orchidaceae
73	<i>Tainia dunnii</i> Rolfe	Orchidaceae
74	<i>Thrixspermum saruwatarii</i>	Orchidaceae
75	<i>Tulotis ussuriensis</i> (Regel et Maack) Hara	Orchidaceae
76	<i>Vrydagzynea nuda</i> Bl	Orchidaceae

**Schedule 2-4 Species listed into the IUCN Red List (2007)**

Number	Species	Family	Level of Protection
1	<i>Cunninghamia lanceolata</i>	Taxodiaceae	LR
2	<i>Fokienia hodginsii</i>	Cupressaceae	LR
3	<i>Cephalotaxus fortunei</i>	Cephalotaxaceae	LR

Number	Species	Family	Level of Protection
4	<i>Cinnamomun micranthum</i>	<i>Lauraceae</i>	<i>LR</i>
5	<i>Dysosma versipellis</i>	<i>Berberidaceae</i>	<i>VU</i>
6	<i>Impatiens obesa</i>	<i>Balsaminaceae</i>	<i>EN</i>
7	<i>Actinidia chrysantha</i>	<i>Actinidiaceae</i>	<i>VU</i>
8	<i>Actinidia stellato-pilosa</i>	<i>Actinidiaceae</i>	<i>EN</i>
9	<i>Semiliquidambar cathayensis</i>	<i>Hamamelidaceae</i>	<i>LR</i>
10	<i>Castanopsis concinna</i>	<i>Fagaceae</i>	<i>VU</i>
11	<i>Castanopsis kawakamii</i>	<i>Fagaceae</i>	<i>LR</i>
12	<i>Fagus longipetiolata</i>	<i>Fagaceae</i>	<i>VU</i>
13	<i>Artocarpus hypargyreus</i>	<i>Moraceae</i>	<i>VU</i>
14	<i>Iles chuniana</i>	<i>Aquifoliaceae</i>	<i>EN</i>
15	<i>Eurycorymbus cavaleriei</i>	<i>Sapindaceae</i>	<i>LR</i>
16	<i>Bretschneidera sinensis</i>	<i>Bretschneideraceae</i>	<i>EN</i>
17	<i>Tapiscia sinensis</i>	<i>Staphyleaceae</i>	<i>VU</i>
18	<i>Halesia macgregorii</i>	<i>Styracaceae</i>	<i>VU</i>
19	<i>Changnienia amoena</i>	<i>Orchidaceae</i>	<i>EN</i>
20	<i>VHabenaria fordii</i>	<i>Orchidaceae</i>	<i>VU</i>

**Schedule 2-5 Species listed into the China Species Red List(2007)**

Number	Species	Family	Level of Protection
1	<i>Pinus taiwanensis</i>	<i>Pinaceae</i>	<i>NT</i>
2	<i>Tsuga longibracteata</i>	<i>Pinaceae</i>	<i>VU</i>
3	<i>Cephalotaxus fortunei</i>	<i>Cephalotaxaceae</i>	<i>NT</i>
4	<i>Cephalotaxus sinensis</i>	<i>Cephalotaxaceae</i>	<i>NT</i>
5	<i>Fokienia hodginsii</i>	<i>Cupressaceae</i>	<i>VU</i>
6	<i>Taxus mairei</i>	<i>Taxaceae</i>	<i>VU</i>
7	<i>Gnetum parvifolium</i>	<i>Gnetaceae</i>	<i>NT</i>
8	<i>Castanopsis concinna</i>	<i>Fagaceae</i>	<i>EN</i>
9	<i>Castanopsis kawakamii</i>	<i>Fagaceae</i>	<i>VU</i>
10	<i>Coptis chinensis var. brevisepala</i>	<i>Ranunculaceae</i>	<i>VU</i>
11	<i>Dysosma versipellis</i>	<i>Berberidaceae</i>	<i>VU</i>
12	<i>Parakmeria lotungensis</i>	<i>Magnoliaceae</i>	<i>VU</i>
13	<i>Tsoongiodendron odorum</i>	<i>Magnoliaceae</i>	<i>VU</i>
14	<i>Cinnamomun micranthum</i>	<i>Lauraceae</i>	<i>VU</i>
15	<i>Litsea foveolata</i>	<i>Lauraceae</i>	<i>EN</i>
16	<i>Litsea hunanensis</i>	<i>Lauraceae</i>	<i>EN</i>
17	<i>Neolitsea ellipsoidea</i>	<i>Lauraceae</i>	<i>VU</i>
18	<i>Neolitsea shingningensis</i>	<i>Lauraceae</i>	<i>EN</i>

Number	Species	Family	Level of Protection
19	<i>Bretschneidera sinensis</i>	<i>Bretschneideraceae</i>	VU
20	<i>Semiliquidambar cathayensis</i>	<i>Hamamelidaceae</i>	VU
21	<i>Ilex chuniana</i>	<i>Aquifoliaceae</i>	EN
22	<i>Ilex fukienensis</i>	<i>Aquifoliaceae</i>	VU
23	<i>Tapiscia sinensis</i>	<i>Staphyleaceae</i>	NT
24	<i>Acer cordatum</i>	<i>Aceraceae</i>	NT
25	<i>Acer tutcheri</i>	<i>Aceraceae</i>	VU
26	<i>Acer wilsonii</i>	<i>Aceraceae</i>	NT
27	<i>Eurycorymbus cavaleriei</i>	<i>Sapindaceae</i>	VU
28	<i>Reevesia pycnantha</i>	<i>Sterculiaceae</i>	EN
29	<i>Blastus cogniauxii</i>	<i>Melastomataceae</i>	EN
30	<i>Pieris formosa</i>	<i>Ericaceae</i>	VU
31	<i>Pieris japonica</i>	<i>Ericaceae</i>	VU
32	<i>Rhododendron eudoxum</i>	<i>Ericaceae</i>	VU
33	<i>Rhododendron rhuyuenense</i>	<i>Ericaceae</i>	VU
34	<i>Rhododendron subflumineum</i>	<i>Ericaceae</i>	VU
35	<i>Halesia macgregorii</i>	<i>Styracaceae</i>	VU
36	<i>Styrax macrocarpus</i>	<i>Styracaceae</i>	EN
37	<i>Phellodendron chinense</i> var. <i>glabriusculum</i>	<i>Rutaceae</i>	VU
38	<i>Anoetochilus roxburghii</i>	<i>Orchidaceae</i>	NT
39	<i>Arundina graminifolia</i>	<i>Orchidaceae</i>	NT
40	<i>Bletilla striata</i>	<i>Orchidaceae</i>	VU
41	<i>Bulbophyllum kwangtungense</i>	<i>Orchidaceae</i>	NT
42	<i>Calanthe densiflora</i>	<i>Orchidaceae</i>	NT
43	<i>Calanthe discolor</i>	<i>Orchidaceae</i>	VU
44	<i>Calanthe graciliflora</i>	<i>Orchidaceae</i>	VU
45	<i>Calanthe tsoongiana</i>	<i>Orchidaceae</i>	VU
46	<i>Cephalanthera erecta</i>	<i>Orchidaceae</i>	NT
47	<i>Cephalanthera falcata</i>	<i>Orchidaceae</i>	NT
48	<i>Changnienia amoena</i>	<i>Orchidaceae</i>	EN
49	<i>Coelogyne fimbriata</i>	<i>Orchidaceae</i>	NT
50	<i>Cymbidium ensifolium</i>	<i>Orchidaceae</i>	VU
51	<i>Cymbidium faberi</i>	<i>Orchidaceae</i>	VU
52	<i>Cymbidium floribundum</i>	<i>Orchidaceae</i>	VU
53	<i>Cymbidium goeringii</i>	<i>Orchidaceae</i>	VU
54	<i>Cymbidium kanran</i>	<i>Orchidaceae</i>	VU
55	<i>Dendrobium moniliforme</i>	<i>Orchidaceae</i>	EN

Number	Species	Family	Level of Protection
56	<i>Dendrobium nobile</i>	Orchidaceae	EN
57	<i>Epigeneium fargesii</i>	Orchidaceae	NT
58	<i>Epipactis thunbergii</i>	Orchidaceae	EN
59	<i>Galeola faberi</i>	Orchidaceae	NT
60	<i>Goodyera biflora</i>	Orchidaceae	NT
61	<i>Goodyera foliosa</i>	Orchidaceae	NT
62	<i>Goodyera henryi</i>	Orchidaceae	NT
63	<i>Goodyera repens</i>	Orchidaceae	NT
64	<i>Habenaria ciliolaris</i>	Orchidaceae	NT
65	<i>Habenaria dentata</i>	Orchidaceae	NT
66	<i>Habenaria fordii</i>	Orchidaceae	NT
67	<i>Habenaria hystrix</i>	Orchidaceae	VU
68	<i>Habenaria petelotii</i>	Orchidaceae	NT
69	<i>Habenaria rhodocheila</i>	Orchidaceae	NT
70	<i>Liparis inaperta</i>	Orchidaceae	NT
71	<i>Liparis nervosa</i>	Orchidaceae	NT
72	<i>Liparis odorata</i>	Orchidaceae	NT
73	<i>Liparis pauliana</i>	Orchidaceae	VU
74	<i>Liparis petiolata</i>	Orchidaceae	NT
75	<i>Microtis unifolia</i>	Orchidaceae	NT
76	<i>Nothodoritis zhejiangensis</i>	Orchidaceae	EN
77	<i>Oberonia japonica</i>	Orchidaceae	NT
78	<i>Peristylus goodyeroides</i>	Orchidaceae	NT
79	<i>Phaius flavus</i>	Orchidaceae	NT
80	<i>Phaius tankervilleae</i>	Orchidaceae	VU
81	<i>Pholidota chinensis</i>	Orchidaceae	NT
82	<i>Platanthera minor</i>	Orchidaceae	NT
83	<i>Platanthera minor</i>	Orchidaceae	NT
84	<i>Pleione bulbocodioides</i>	Orchidaceae	VU
85	<i>Spathoglottis pubescens</i>	Orchidaceae	VU
86	<i>Tainia dunnii</i>	Orchidaceae	NT
87	<i>Tulotis ussuriensis</i>	Orchidaceae	NT
88	<i>Vrydagzynea nuda</i>	Orchidaceae	VU

**Schedule 2-6 Major bamboo species in Chongyi Hakka Terraces**

Number	Species	Number	Species
1	<i>Ph. edulis</i> (Carr.) H. de Lehai	2	<i>I. tessellatus</i> (Munro) Keng f
3	<i>B. multiplex</i> (Lour.) Raeschel ex J.A.et J.H.Schult cv. Yellowstripe	4	<i>B. multiplex</i> (Lour.) Raeschel ex J. A. et J. H. Schult. cv. Fernleaf



Number	Species	Number	Species
5	<i>Pleioblastus amarus</i> (Keng) Keng f	6	<i>Ph. heteroclada</i> Oliver
7	<i>Indosasa crassiflora</i> McClure	8	<i>I. glabrata</i> C. D. Chu et C. S. Chao
9	<i>B. pervariabilis</i> McClure	10	<i>Ph. nidularia</i> Munro
11	<i>Dendrocalamopsis oldhami</i> (Munro) Keng f	12	<i>Indocalamus latifolius</i> (Keng) McClure
13	<i>I. parvifolia</i> C. S. Chao et Q. H. Dai	14	<i>I. longianritus</i> Hand.-Mazz
15	<i>Dendrocalamus membranaceus</i> Munro	16	<i>Fargesia fractiflexa</i> Yi
17	<i>Bambusa gibba</i> McClure	18	<i>Phyllostachys bambusoides</i> Sieb. et Zucc
19	<i>Bambusa ventricosa</i> McClure	20	<i>Ph. nigra</i> (Lodd. ex Lindl.) Munro var. <i>henonis</i> (Mitif.) Stapf ex Rendle
21	<i>Fargesia spathacea</i> Franch	22	<i>Dendrocalamus latiflorus</i> Munro
23	<i>Sasa longiligulata</i> McClure		

**Schedule 2-7 Major pharmaceutical plant species in Chongyi Hakka Terraces**

Number	Species	Number	Species
1	<i>Rehmannia glutinosa</i> Libosch	2	<i>Corydalis turtchaninovii</i> Bess
3	<i>Atractylodes macrocephala</i>	4	<i>Gastrodia elata</i>
5	<i>Coydalis decumbens</i>	6	<i>Mentha haplocalyx</i> Briq
7	<i>Dendranthema morifolium</i>	8	<i>Eucommia ulmoides</i> Oliver
9	<i>Coix chinensis</i> Tod	10	<i>Magnolia officinalis</i> Rehd
11	<i>Fructus aurantii</i>	12	<i>Coptis chinensis</i> Franch
13	<i>Codonopsis pilosula</i>	14	<i>Poria cocos</i>
15	<i>Lonicera japonica</i>	16	<i>Platycladus orientalis</i>
17	<i>Kadsura interior</i>	18	<i>Euphorbia hirta</i>
19	<i>Tupidanthus calyptratus</i> Hook	20	<i>Thunbergia grandiflora</i>
21	<i>Diphasiastrum complanatum</i>	22	<i>Viscum coloratum</i>
23	<i>Rumex madaio</i> Makino R daiwoo Makino	24	<i>Sargentgloryvine</i> Stem
25	<i>Ribes davidii</i> Franch	26	<i>Mahonia fortunei</i>
27	<i>Wikstroemia indica</i>	28	<i>Parabarium micranthum</i>
29	<i>Polygonatum sibiricum</i>	30	<i>Scutellaria barbata</i>
31	<i>Origanum vulgare</i> Linn	32	<i>Pinellia ternata</i>
33	<i>Arisaema heterophyllum</i> Blume	34	<i>Typhonium giganteum</i>
35	<i>Polygonatum odoratum</i>	36	<i>Psychotria serpens</i> Linn
37	<i>Curcuma longa</i>	38	<i>Paris polyphylla</i>
39	<i>Broadleaf Mahonia</i>	40	<i>Stephania tetrandra</i>
41	<i>Daphniphyllum calycinum</i> Benth	42	<i>Bauhinia championii</i>
43	<i>Pterolobium punctatum</i> Hemsl	44	<i>Tripterygium wilfordii</i>
45	<i>Citrus medica</i> L var <i>sarcodactylis</i>	46	<i>Gardenia jasminoides</i> Ellis

Number	Species	Number	Species
	<i>Swingle</i>		
47	<i>Uncaria tomentosa</i>	48	<i>Clematis chinensis</i>
49	<i>Elephantopus scaber</i>	50	<i>Ardisia brevicaulis Diels</i>
51	<i>Dysosma versipellis</i>	52	<i>Semiliquidambar cathayensis Chang</i>
53	<i>Acanthopanax gracilistylus</i>	54	<i>Tetrastigma hemsleyanum</i>
55	<i>Rhizoma Smilacis Glabrae</i>	56	<i>Sophora flavescens</i>
57	<i>Mesona chinensis Benth</i>		

## 2.2 Wild animal resources

Schedule 2-8 National key protected wild animal species

Number	Species	Family	Level of Protection
1	<i>Neofelis nebulosa</i>	<i>Felidae</i>	I
2	<i>Panthera pardus</i>	<i>Felidae</i>	I
3	<i>Tragopan caboti</i>	<i>Phasianidae</i>	I
4	<i>Syrnaticus ellioti</i>	<i>Phasianidae</i>	I
5	<i>Python molurus</i>	<i>Boidae</i>	I
6	<i>Cervus nippon kopschi</i>	<i>Cervidae</i>	I
7	<i>viverricula indica</i>	<i>Viverridae</i>	II
8	<i>prionodon pardicolor</i>	<i>Viverridae</i>	II
9	<i>Macacathibetana</i>	<i>Cercopithecidae</i>	II
10	<i>Manis pentadactyla</i>	<i>Manidae</i>	II
11	<i>Cervus unicolor</i>	<i>Cervidae</i>	II
12	<i>Capricornis sumatraensis</i>	<i>Bovidae</i>	II
13	<i>Hoplobatrachus rugulosus</i>	<i>Ranidae</i>	II
14	<i>Cuon alpinus</i>	<i>canidae</i>	II
15	<i>Martes flavigula</i>	<i>Mustelidae</i>	II
16	<i>Milvus migrans</i>	<i>Accipitridae</i>	II
17	<i>Circus cyaneus</i>	<i>Accipitridae</i>	II
18	<i>Accipter virgatus</i>	<i>Accipitridae</i>	II
19	<i>Pitta nympha</i>	<i>Pittidae</i>	II
20	<i>Centropus sinensis</i>	<i>Cuculidae</i>	II
21	<i>Centropus bengalensis</i>	<i>Cuculidae</i>	II
22	<i>Macropygia unchall</i>	<i>Columbidae</i>	II
23	<i>Pucrasia macrolopha</i>	<i>Phasianidae</i>	II
24	<i>Lophura nycthemera</i>	<i>Phasianidae</i>	II
25	<i>Asio otus</i>	<i>Strigidae</i>	II
26	<i>Strix leptogrammica</i>	<i>Strigidae</i>	II
27	<i>Ninox scutulata</i>	<i>Strigidae</i>	II
28	<i>Asio flammeus</i>	<i>Strigidae</i>	II
29	<i>Glaucidium brodiei</i>	<i>Strigidae</i>	II

Number	Species	Family	Level of Protection
30	<i>Glaucidium cuculoides</i>	<i>Strigidae</i>	II
31	<i>Tyto longimembris</i>	<i>Tytonidae</i>	II
32	<i>Accipter virgatus</i>	<i>Accipitridae</i>	II
33	<i>Accipter soloensis</i>	<i>Accipitridae</i>	II
34	<i>Accipiter nisus</i>	<i>Accipitridae</i>	II
35	<i>Spilornis cheela</i>	<i>Accipitridae</i>	II
36	<i>Accipiter gentilis</i>	<i>Accipitridae</i>	II
37	<i>Sizaetus nipalensis</i>	<i>Accipitridae</i>	II
38	<i>Aquila clanga</i>	<i>Accipitridae</i>	II
39	<i>Circus melanoleucos</i>	<i>Accipitridae</i>	II
40	<i>Falco amurensis</i>	<i>Falconidae</i>	II
41	<i>Falco peregrinus</i>	<i>Falconidae</i>	II
42	<i>Falco tinnunculus</i>	<i>Falconidae</i>	II
43	<i>Microhierax melanoleucos</i>	<i>Falconidae</i>	II
44	<i>Falco peregrinus</i>	<i>Falconidae</i>	II
45	<i>Falco coiumbarius</i>	<i>Falconidae</i>	II
46	<i>Buteo buteo</i>	<i>Accipitridae</i>	II
47	<i>Aviceda leuphotes</i>	<i>Accipitridae</i>	II
48	<i>Lutra lutra</i>	<i>Mustelidae</i>	II
49	<i>Viverra zibetha</i>	<i>viverridac</i>	II
50	<i>Andrias davidianus</i>	<i>Cryptobrachidae</i>	II
51	<i>Catopuma temminckii</i>	<i>Felidae</i>	II
52	<i>Hydropotes</i>	<i>Cervidae</i>	II
53	<i>Elaphodus cephalophus</i>	<i>Cervidae</i>	II
54	<i>Carabus (Apotopterus) davidi</i>	<i>Carabidae</i>	II
55	<i>Carabus (coptolabrus) lafossei</i>	<i>Carabidae</i>	II
56	<i>Cheirotonus jonsoni Jordan</i>	<i>Euchiridae</i>	II

**Schedule 2-9 Species listed into China Red Data Book of Endangered Animals(1998)**

Number	Species	Family
1	<i>Manis pentadactyla</i>	<i>Manidae</i>
2	<i>Neofelis nebulosa</i>	<i>Felidae</i>
3	<i>Panthera pardus</i>	<i>Felidae</i>
4	<i>Cuon alpinus</i>	<i>Canidae</i>
5	<i>Felis bengalensis</i>	<i>Felidae</i>
6	<i>Viverra zibetha</i>	<i>viverridac</i>
7	<i>Capricornis sumatraensis</i>	<i>Bovida</i>
8	<i>Lutra lutra</i>	<i>Mustelidae</i>
9	<i>Rana hanluica</i>	<i>Ranidae</i>
10	<i>Paa spinosa</i>	<i>Ranidae</i>
11	<i>Platysternon megacephalum</i>	<i>Platysternidae</i>

12	<i>Chinemys reevesii</i>	<i>Bataguridae</i>
13	<i>Pelodiscus sinensis</i>	<i>Trionychidae</i>
14	<i>Amphiesma craspedogaster</i>	<i>Xenopeltidae</i>
15	<i>Elaphe carinata</i>	<i>Colubridae</i>
16	<i>Elaphe mandarina</i>	<i>Colubridae</i>
17	<i>Enhydris chinensis</i>	<i>Colubridae</i>
18	<i>Enhydris plunbea</i>	<i>Colubridae</i>
19	<i>Elaphe p. porphyracea</i>	<i>Colubridae</i>
20	<i>Ptyas korros</i>	<i>Colubridae</i>
21	<i>Bungarus m. multicinctus</i>	<i>Elapidae</i>
22	<i>Naja atra</i>	<i>Elapidae</i>
23	<i>Deinagkistrodon acutus</i>	<i>Viperidae</i>
24	<i>Gloydus brevicaudus</i>	<i>Viperidae</i>
25	<i>Ptyas mucosus</i>	<i>Colubridae</i>

**Schedule 2-10 Species belonging to the endemic species of China**

<b>Number</b>	<b>Species</b>	<b>Family</b>
1	<i>Muntiacus reevesi</i>	<i>Cervidae</i>
2	<i>Mogera insularis</i>	<i>Talpidae</i>
3	<i>Amphiesma craspedogaster</i>	<i>Xenopeltidae</i>
4	<i>Eumeces chinensis</i>	<i>Scincidae</i>
5	<i>Eumeces tlegans</i>	<i>Scincidae</i>
6	<i>Tropidophorus hainanus</i>	<i>Scincidae</i>
7	<i>Takydromus septentrionali</i>	<i>Lacertidae</i>
8	<i>Amphiesma craspedogaster</i>	<i>Colubridae</i>
9	<i>Oligodon ornatus</i>	<i>Colubridae</i>
10	<i>Opisthotropis latouchii</i>	<i>Colubridae</i>
11	<i>Pareas stanleyi</i>	<i>Colubridae</i>
12	<i>Sinonatrix aequifasciata</i>	<i>Colubridae</i>
13	<i>Sinonatrix annularis</i>	<i>Colubridae</i>
14	<i>Sinomicrurus kelloggi</i>	<i>Elapidae</i>
15	<i>Macropisthodon rudis rudis</i>	<i>Colubridae</i>
16	<i>Pachytriton brevipe</i>	<i>Salamandridae</i>
17	<i>Leptolalax liui</i>	<i>Megophryidae</i>
18	<i>Megophrys brachykolos</i>	<i>Megophryidae</i>
19	<i>Vibrissaphora liui yaoshanensis</i>	<i>Megophryidae</i>
20	<i>Amolops ricketti</i>	<i>Ranidae</i>
21	<i>Hylarana adenopleura</i>	<i>Ranidae</i>
22	<i>Hylarana guentheri</i>	<i>Ranidae</i>
23	<i>Hylarana latouchii</i>	<i>Ranidae</i>
24	<i>Odorrana schmackeri</i>	<i>Ranidae</i>

<b>Number</b>	<b>Species</b>	<b>Family</b>
25	<i>Odorrana versabilis</i>	<i>Ranidae</i>
26	<i>Pelophylax nigromaculatus</i>	<i>Ranidae</i>
27	<i>Rana hanluica</i>	<i>Ranidae</i>

**Schedule 2-11 Species of the common-seen edible and rare large fungus**

<b>Species</b>	<b>Species</b>
<i>Auricularia auricular (Lex Hook) Underw</i>	<i>Tremella fuciformis Berk</i>
<i>Cantharellus cibarius Fr</i>	<i>Volvariella volvacea (Bull :Fr) Sing</i>
<i>Lentinus edodes (Berk) Sing</i>	<i>Agrocybe chaxingu huang</i>
<i>Agaricus silvaticus Schaeff Ex Fr</i>	<i>Cordyceps nutans Pat</i>
<i>Cordyceps sobolifera (Hill) Berk et Br</i>	<i>Ganoderma tsunodae (yasuda)Imaz</i>
<i>Cordyceps sphecocephala (Kl)Mass</i>	<i>Calostoma cinnabararium (Desv) Mass</i>
<i>Calostoma japonicum PHenn</i>	<i>Fistulina hepatica (Schaeff) Fr</i>
<i>Tremella foliacea Pers:Fr</i>	<i>Poria cocos (Schw)Wolf</i>
<i>Ganoderma lucidum (Leyss :Fr) Karst</i>	<i>Schizophyllum commne Fr</i>
<i>Laetiporus sulphureus (Fr) Murrill</i>	<i>Cryptoporus volvatus (Peck) Shear</i>
<i>Boletinus cavipes (Opat) Kalchbr</i>	<i>Lycoperdon pusillum Batsch :Pers</i>
<i>Dictyophora multicolor Bork Et Br</i>	



## Annex 2 The list of biodiversity in Longsheng Longji Terraces

**Table 1 Precious plants resources in Longji Terraces**

Number	Species	Level of Protection
1	<i>Taxus wallichiana</i> var. <i>mairei</i>	Class I national protected plant
2	<i>Metasequoia glyptostroboides</i> Hu et Cheng	Class I national protected plant
3	<i>Fokienia hodginsii</i> (Dunn) Henry et Thomas	Class II national protected plant
4	<i>Alsophila spinulosa</i>	Class II national protected plant
5	<i>Eucommia ulmoides</i> Oliv	Class II national protected plant
6	<i>Cinnamomum camphora</i> (L. ) presl	Class II national protected plant
7	<i>Phoebe bournei</i>	Class II national protected plant
8	<i>Ginkgo biloba</i> L	Class II national protected plant
9	Pear	Fruit trees
10	Plum	Fruit trees
11	Red bayberry	Fruit trees
12	Citrus	Fruit trees
13	Loquat	Fruit trees
14	Blueberries	Fruit trees
15	Eucommia bark	Medicinal plants
16	Amur cork-tree bark	Medicinal plants
17	Mangnolia officinalis bark	Medicinal plants
18	Lysimachia foenum-graecum Hance	Medicinal plants
19	Camellia	Oil-bearing crops
20	Tung oil tree	Oil-bearing crops
21	Momordica grosvenori	Beverage type plants
22	Bamboo shoots	wild vegetable varieties
23	Bracken	wild vegetable varieties
24	Water celery	wild vegetable varieties
25	Houttuynia cordata	wild vegetable varieties
26	Duck feet vegetable (artemisia lactiflora root)	wild vegetable varieties
27	Octagon	Spice plants
28	Chinese prickly ash	Spice plants
29	Azalea	Ornamental plants
30	Orchid	Ornamental plants

**Table 2 Precious wild animals resources in Longji terraces**

Number	Species	Level of Protection
1	<i>Python molurus</i>	Class I national protected animal
2	<i>Moschus berezovskii</i>	Class I national protected animal

3	<i>Aviceda leuphotes</i>	Class II national protected animal
4	<i>Echinotriton asperrimus</i>	Class II national protected animal
5	<i>Milvus migrans</i>	Class II national protected animal
6	<i>Centropus sinensis</i>	Class II national protected animal
7	<i>Tyto longimembris</i>	Class II national protected animal
8	<i>Glaucidium cuculoides</i>	Class II national protected animal
9	<i>Macaca mulatta</i>	Class II national protected animal
10	<i>Macaca arctoides</i>	Class II national protected animal
11	<i>Viverra zibetha</i>	Class II national protected animal
12	<i>Lutra lutra</i>	Class II national protected animal
13	<i>Macaca thibetana</i>	Class II national protected animal
14	<i>Viverricula indica</i>	Class II national protected animal
15	<i>Prionodon pardicolor</i>	Class II national protected animal
16	<i>Capricornis milneedwardsii</i>	Class II national protected animal
17	<i>Centropus bengalensis</i>	Class II national protected animal
18	<i>Chrysolophus pictus</i>	Class II national protected animal
19	<i>Falco subbuteo</i>	Class II national protected animal
20	<i>Accipiter soloensis</i>	Class II national protected animal
21	<i>Lophura nycthemera</i>	Class II national protected animal
22	<i>Pucrasia macrolopha</i>	Class II national protected animal
23	<i>Tragopan temminckii</i>	Class II national protected animal
24	<i>Accipiter virgatus</i>	Class II national protected animal
25	<i>Falco tinnunculus</i>	Class II national protected animal
26	<i>Accipiter nisus</i>	Class II national protected animal
27	<i>Spilornis cheela</i>	Class II national protected animal
28	<i>Hoplobatrachus chinensis</i>	Class II national protected animal
29	<i>Geoemyda spengleri</i>	Class II national protected animal
30	<i>Andrias davidianus</i>	Class II national protected animal
<b>31</b>	<i>Syrmaticus ellioti</i>	Class II national protected animal

**Table 3 Crop varieties in Longji Terraces**

Varieties	Name	Notes
Rice	Horse-tail Glutinous	Local Traditional
	Red Su Glutinous	Local Traditional
	Guangxuan 3	Introduced
	Red Rose Early	Introduced
	Unit 1	Introduced
	Shanyou 63	Introduced
	Xinhei 9	Introduced
	Honglisimiao	Introduced

	Home Tonghe	Local Old
	Bleached Round	Local Old
	Rongpabai	Local Old
	White Home Glutinous	Local Old
Corn	Early Corn	Local Old
	White Horse Teeth	Introduced
	Du'an 2	Introduced
	Guidan 16	Introduced
	Taizhen	Introduced
	Guangxi Sweet 566	Introduced
	Guangxi Glutinous 518	Introduced
Sweet Potato	Jade Beauty Head 602	Introduced
	Redskin Yellow-core	Local Old
	Whiteskin White-core	Local Old
	Areca-Nut	Local Old
Others	64—283	Introduced
	Bean, peanuts and rape, Mahogany fruit, tea, pepper, taro	

**Table 4 Livestock varieties in Longji Terraces**

Number	Species
1	Chicken
2	Duck
3	Goose
4	Rabbit
5	Dog
6	Pig
7	Horse
8	Cattle
9	Goat
10	Bamboo rat
11	Giant salamander

# Annex 3 The list of biodiversity in Xinhua Ziquejie Terraces

## 1. Agricultural biodiversity

### (1) Traditional rice biodiversity

Table 1 Traditional Rice Varieties in the Ziquejie Terraces

Local Name	Local Traditional Species	Introduced Traditional Species	Main Use
Baisha Glutinous rice	√		wine or glutinous rice cake
Yunnong Glutinous rice		√	wine or food
No.1 Jing Glutinous rice		√	wine or food
Magu red rice	√		food
Black tribute rice	√		goods or food
Black rice		√	goods or food
Purple scented rice		√	goods or food
Red rice		√	goods or food

### (2) Other crop biodiversity

Table 2 Other Crop Varieties in the Ziquejie Terraces

Category	Varieties
Cereals and Grains	Finger millet*, Foxtail millet*, Tartary buckwheat*
Peas and beans	soybean*, black bean*, rice bean*, mung bean*, broad bean*
Tuber crops	Potato*, sweet potato (including purple heart, Guangdong white potato, pumpkin potato, yellow heart potato)
Oil crops	oilseed rape, tea-oil tree, peanut*
Vegetables	Cabbage, radish, carrot, celery, squash, pepper, garlic, onion, leek, coriander, tomatoes, amaranth, broccoli, lettuce, green bean, eggplant
Melons	chestnut, bayberry, grapes, loquat, grapefruit, cherry, watermelon, muskmelon, pear, peach, plum
Medical plants	Honeysuckle, <i>Officinal magnolia</i> Bark, <i>Eucommia ulmoides</i> olive, Amur Grape Stem, Medicinal Evodia Fruit, Cape jasmine, ginkgo, <i>Fragrant solomonseal</i> Rhizome, lily, <i>gastrodia elata</i> , pearl barley, Polygonatum, <i>Rhizoma belamcandae</i> , <i>Platycodon grandiflorum</i> , <i>Gynostemma pentaphyllum</i> , <i>Atractylis ovata</i> , <i>Rhizoma coptidis</i> , Indian Buead, <i>nodakenin</i> , herbaceous peony, chrysanthemum, <i>Heartleaf houttuynia</i> Herb, <i>Scrophularia</i>

	<i>ningpoensis</i> Hemsl, honeysuckle
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\*Traditional varieties

### (3) Livestock biodiversity

**Table 3 Livestock Varieties in the Ziquejie Terraces**

Category	Varieties
Chicken	Yellow Hair Chicken, Barred Plymouth Rock chickens, laying hens, black-bone chicken, dwarf chicken
Duck	Shaoxing duck, southern egg-laying duck, Beijing ducks
Pig	Landrace pig, Large Yorkshire, Duroc, Xiangxi Black pig, Ningxiang pigs, DLY (Hybrids of Duroc, Landrace and Large Yorkshire )
Cattle	Xiangnan Yellow cattle, Xiangxi Yellow cattle, hybrids of Angus cattle and local cattle breeds, hybrids of Lee Limousin and local cattle breeds, and hybrids of Simmental Beef Cattle and local cattle breeds
Sheep	black goats and Boar Goats

### (4) Aquatic biodiversity

**Table 4 Aquatic Varieties in the Ziquejie Terraces**

Category	Scientific Name
Fish	<i>Ctenopharyngodon idellus</i> , <i>Cyprinus carpio</i> , <i>Parabramis pekinensis</i> , <i>Parabramis pekinensis</i> , <i>Mylopharyngodon piceus</i> , <i>Spualio barbatus Curriculus</i> , <i>Culter erythropterus Basilewsl</i> , <i>Erythroculter mongolicus</i> , <i>Erythroculter ilishaeformis</i> , <i>Plagiognathops microlepis</i> , <i>Xenocypris davidi</i> , <i>Magalobrama Tarterminalis</i> , <i>Bluntnose black bream</i> , <i>Pseudorasbora parva</i> , <i>Abbottina tungtingensis</i> , <i>Cypriniformes</i> , <i>Carassius auratus</i> , <i>Hypophthalmichthys molitrix</i> , <i>Hypophthalmichthys nobilis</i> , <i>Cobitis taenia</i> , <i>Misgurnus anguillicaudatus</i> , <i>Mastacembelus aculeatus</i> , <i>Pelteobagrus fulvidraco</i>
Crustacean	<i>Brachyura</i> , <i>Oophana heudei</i>
Amphibian	<i>Bufo bufo gargarizans</i> , <i>Rana nigromaculata</i>
Mollusk	<i>Pheretima</i>
Insect	<i>Araneida</i> , <i>Muscidae</i> , <i>Culicidae</i>
Aquatic plant	<i>Spirodela polyrrhiza</i> (L.) Schleid.

## 2. Associated biodiversity

### (1) The main protected plants in the Ziquejie Terraces



**Table 5 List of the main protected plants in the Ziquejie Terraces**

Scientific Name	Protection Category
<i>Ginkgo biloba</i> L.	Class I national protected plant
<i>Metasequoia glyptostroboides</i> Hu et Cheng	Class I national protected plant
<i>Taxus chinensis</i> (Pilger) Rehd	Class I national protected plant
<i>T.mairei</i> (Lemee et Lévl) Cheng et L.K. Fu	Class I national protected plant
<i>Bretschneidera sinensis</i> Hemsl.	Class I national protected plant
<i>Pseudolarix amabilis</i> (Nelson) Rehd	Class II national protected plant
<i>Emmenopterys henryi</i> Oliv	Class II national protected plant
<i>Cercidiphyllum japonicum</i> Sieb.et Zucc	Class II national protected plant
<i>Magnolia officinalis</i> Rehd.et Wils	Class II national protected plant
<i>M.officinalis ssp. biloba</i> (Rehd. et Wils) Law	Class II national protected plant
<i>Ormosia henryi</i> Prain	Class II national protected plant
<i>Cinnamomum camphor</i> (L.) Presl	Class II national protected plant
<i>Fagopyrum dibotrys</i> (D.Don) Hara	Class II national protected plant
<i>Torreya grandlis</i> Forstex Lindl	Class II national protected plant
<i>Fokienia hodginsii</i> (Dunm) Henry et Thomas	Class II national protected plant
<i>Eucommia ulmides</i> Oliv	Class II national protected plant
<i>Tapiscia sinensis</i> Oliv	Class III national protected plant
<i>Pteroceltis tatarinowii</i> Maxim	Class III national protected plant
<i>Dysosma versipellis</i> (Hance) M.Cheng	Class III national protected plant
<i>Gastrodia elata</i> Bl	Class III national protected plant
<i>Michelia fioveolata</i> Merr	High ornamental value plant
<i>M.platypetala</i> Hand Mazz	High ornamental value plant
<i>Aesculus wilsonii</i> Rehd	High ornamental value plant
<i>Temstroemia gymnanthera</i> (Wight et Arn.) Spragne	High ornamental value plant
<i>Schima argentea</i> Pritz	High ornamental value plant
<i>S.superba</i> gardn et Champ.	High ornamental value plant
<i>Campsis grandiflora</i> (Thunb. ) Loisel	High ornamental value plant
<i>Kalopanax septemlobus</i> (Thunb.) Koidz	High ornamental value plant
<i>Sapindus mukorossi</i> Gaertn Fruet.	High ornamental value plant
<i>Aibizia julibrissin</i> Durazz.	High ornamental value plant
<i>A.kalkora</i> (Roxb.) Prain	High ornamental value plant
<i>GyclobalanopsiS giiva</i> (Bl.) Oerst.	High ornamental value plant
<i>Nyssa sinensis</i> Oliv.	High ornamental value plant
<i>Sassafras tsumu</i> (Hemsl.) Hemsl	High ornamental value plant
<i>Dalbergia hupeana</i> Hance	High ornamental value plant
<i>Decaisnea fargesii</i> Franch.	High ornamental value plant
<i>Liquidambar formosana</i> Hance	High ornamental value plant
<i>Osmanthus fragrans</i> Lour.var.aurantiacus Makino	High ornamental value plant
<i>Chimonobambusa quadragnulariS</i> (Femzl.) Makino	High ornamental value plant
<i>Phyllostachys nigra</i> (Lodd.) Munro	High ornamental value plant
<i>Lonicera japonica</i> Thunb	Important medicinal plant

Scientific Name	Protection Category
<i>Bletilla striata</i> (Thunb. ) Reichb. f.	Important medicinal plant
<i>Aristolochia debilis</i> Sieb.et Zucc.	Important medicinal plant
<i>Polygonum aviculare</i> L.	Important medicinal plant
<i>Potentilla discolor</i> Bunge	Important medicinal plant
<i>Rosa lavigata</i> Michx.	Important medicinal plant
<i>Agrimonia pilosa</i> Ledeb.	Important medicinal plant
<i>Pueraria lobata</i> (Willd.) Ohwi	Important medicinal plant
<i>Polygonum cuspidatum</i> Sieb.et Zucc.	Important medicinal plant
<i>Polygonum cyrtonema</i> Hua	Important medicinal plant
<i>P.officinale</i> All.	Important medicinal plant
<i>Lilium brownii</i> vat.Viridulum Baker	Important medicinal plant
<i>Disporum bodinieri</i> (Lavl. et Vant. ) Wang et Tang	Important medicinal plant
<i>Scilla scilloides</i> (Lindl. ) Druce	Important medicinal plant
<i>Tricyrtis bakeri</i> Koidz	Important medicinal plant
<i>Smilax glabra</i> Roxb.	Important medicinal plant
<i>Glechoma longituba</i> (Nakai) Kupr.	Important medicinal plant
<i>Piper wallichii</i> (Mig.) Hand. — Mazz	Important medicinal plant
<i>Dioscorea bulbifexa</i> L.	Important medicinal plant
<i>Dendranthema indicum</i> (L.) Des Moul	Important medicinal plant
<i>Asarum forbesii</i> Maxim.	Important medicinal plant
<i>A.sieboldii</i> Miq.	Important medicinal plant
<i>Acorus tatarinowii</i> Schott	Important medicinal plant
<i>Drynaria fortunei</i> (Kunze) J.Smith	Important medicinal plant
<i>Coix lacryma-jobi</i> L. Var.ma-yuen (Romanet) Stopf	Important medicinal plant
<i>Peucedanum decursivum</i> (Miq.) Maxim.	Important medicinal plant
<i>Polygonum multiflorum</i> Thunb	Important medicinal plant
<i>Gardenia jasminoides</i> Ellis	Important medicinal plant
<i>Uncaria rhynchophylla</i> (Miq.) Jacks	Important medicinal plant
<i>Trichosanthes kirilowii</i> Maxim	Important medicinal plant
<i>Mahonia fortunei</i> (Lind) Fedde	Important medicinal plant
<i>Adenophora stricta</i> Miq.	Important medicinal plant
<i>Trachelospermum jasminoides</i> (Lindl.) Lem.	Important medicinal plant
<i>Dipsacus japonicus</i> Miq.	Important medicinal plant
<i>Lindera aggregata</i> (Sims) Kosterm	Important medicinal plant
<i>Ardisia japonica</i> (Hornsted) Bl.	Important medicinal plant
<i>Valeriana officinalis</i> L.	Important medicinal plant
<i>Cyclocarya paliurus</i> (Batal.) Iljinsk.	Important medicinal plant
<i>Magnolia denudata</i> Desr.	Important medicinal plant
<i>Saururus chinensis</i> (Laur)Baill.	Important medicinal plant
<i>Illicium lanceolatum</i> A.C.Smith	Important medicinal plant
<i>Sarcococca ruscifolia</i> Stapf	Important medicinal plant
<i>Stachyurus chircensis</i> Franch.	Important medicinal plant

Scientific Name	Protection Category
<i>S.himataicus</i> Hook f.et Arn.	Important medicinal plant
<i>Lysimachia Paridiformis</i> Franch	Important medicinal plant
<i>Solanum lyratum</i> Thunb.	Important medicinal plant
<i>Corydalis decumbens</i> (Thunb.) Pers.	Important medicinal plant
<i>Astilbe chinensis</i> Franch. etSav.	Important medicinal plant
<i>Phyllanthus urinaria</i> . L	Important medicinal plant
<i>Panax pseudo-ginseng</i> Wall. var. japonicus (C.A.Mey.) Hoo et Tseng	Important medicinal plant
<i>Cunninghamia lanceolata</i> (Lamb.) Hook.	Economic forest tree species
<i>Pinus massoniana</i> Lamb.	Main economic forest tree species
<i>Cupressus funebris</i> Endl	Main economic forest tree species
<i>Toonasinensis</i> (A. Jass) Roem	Main economic forest tree species
<i>Paulownia fortunei</i> Hemsl	Main economic forest tree species
<i>Toxicodendron vernicifluum</i> (Stokes) F.A.Barkl	Main economic forest tree species
<i>Vernia fordii</i> (Hemsl) Airy-Shaw	Main economic forest tree species
<i>Camellia oleifera</i> Abel	Main economic forest tree species
<i>Citrus reticulata</i> Blance	Main economic forest tree species
<i>Txachycarpus fortunei</i> H. Wenall	Main economic forest tree species
<i>Phyllostachys pubescens</i> Mazelex H. Delehaie	Main economic forest tree species

## (2) The main protected animals in the Ziquejie Terraces

**Table 6 List of the main protected animals in the Ziquejie Terraces**

Scientific Name	Protection Category
<i>Neofelis nebulose</i> Griffith	Class I national protected animal
<i>Python molurus</i>	Class I national protected animal
<i>Macaca mulatta</i> Zimmermann	Class II national protected animal
<i>Manis pentadactyla</i> Linnaeus	Class II national protected animal
<i>Lutra lutra</i> Linnaeus	Class II national protected animal
<i>Uiverra zibetha</i> Linnaeus	Class II national protected animal
<i>Moschus moscheiferus</i> Linnaeus	Class II national protected animal
<i>Paguma larvata</i> Hamilton Smith	Class II national protected animal
<i>Capricornis bumatraensis</i> Bechstein	Class II national protected animal
<i>Megalobatrachus danidianus</i> Blanchard	Class II national protected animal
<i>Rana tigrina rugulosa</i> Wiegmann	Class II national protected animal
<i>Chrysolophas pictus</i> Linnaeus	Class II national protected animal
<i>Chrysolophus awcherstice</i> Loadbeeter	Class II national protected animal
<i>Lophura nycthemera</i> Linnaeus	Class II national protected animal
<i>Tragopan temminckii</i> Gray	Class II national protected animal
<i>Vulpes V. hole</i>	Class III national protected animal
<i>Mustela sibirica davidiana</i>	Class III national protected animal

<b>Scientific Name</b>	<b>Protection Category</b>
<i>Martes f. flavigula</i>	Class III national protected animal
<i>Hystrix hodgsoni subcristata</i>	Class III national protected animal
<i>Bambusicola t. thoracica</i>	Class III national protected animal
<i>Phasianus colchicus torquatus</i>	Class III national protected animal
<i>Streptopelia O. orientalis</i>	Class III national protected animal
<i>Leiothrix l. lutea</i>	Class III national protected animal
<i>Porzana fusca</i> Linncous	Class III national protected animal
<i>Ardeola bachus</i> Bonaparte	Class III national protected animal
<i>Lepus S. sinensis</i>	Class III national protected animal
<i>Dinodon septentrionalis</i> Guenther	Class III national protected animal
<i>Lycodon ruhstrati</i> Fischer	Class III national protected animal
<i>Natrix aequifasciata</i> Barbour	Class III national protected animal
<i>Netrix stolata</i> Linnaeus	Class III national protected animal
<i>Opheodrys major</i> Gantor	Class III national protected animal
<i>Zaocys dhumnades</i> Gantor	Class III national protected animal
<i>Naja naja</i> Linnaeus	Class III national protected animal
<i>Trimeresurus mucrosquamatus</i>	Class III national protected animal
<i>Trimerosurus S. strjnegeri</i>	Class III national protected animal
<i>Bufo B. gargarizans</i>	Class III national protected animal
<i>Rana boulenger</i>	Class III national protected animal
<i>Rana limnochariS</i>	Class III national protected animal
<i>Rana margnratae</i>	Class III national protected animal
<i>Rana nigromaculata</i>	Class III national protected animal
<i>Rana temporaria</i>	Class III national protected animal

## Annex 4 The list of biodiversity in Youxi Lianhe Terraces

### 1. List of agricultural biodiversity in Lianhe Terrace

**Table 1: List of Traditional Rice Varieties Planted in Lianhe Terrace**

Serial No	Scientific Name	Serial No	Scientific Name	Serial No	Scientific Name
1	<i>Oryza sativa</i> 'Huzao'	25	<i>Oryza sativa</i> 'Cold waterdrop'	49	<i>Oryza sativa</i> '7944'
2	<i>Oryza sativa</i> 'Youmangdadong'	26	<i>Oryza sativa</i> 'Lengshuino'	50	<i>Oryza sativa</i> 'Shenghong16'
3	<i>Oryza sativa</i> 'Yezhuti'	27	<i>Oryza sativa</i> 'Youxi Grain'	51	<i>Oryza sativa</i> '77175'
4	<i>Oryza sativa</i> 'Hongzaonuo'	28	<i>Oryza sativa</i> 'Hongqushu'	52	<i>Oryza sativa</i> '78130'
5	<i>Oryza sativa</i> 'Baikeshu'	29	<i>Oryza sativa</i> 'Heinuomi'	53	<i>Oryza sativa</i> 'Aijiaonantehao'
6	<i>Oryza sativa</i> 'Huangzhishu'	30	<i>Oryza sativa</i> 'Dwarf white'	54	<i>Oryza sativa</i> 'Nuogu'
7	<i>Oryza sativa</i> 'Nongken58'	31	<i>Oryza sativa</i> 'Dark Rounded Grain'	55	<i>Oryza sativa</i> 'Gutianbai'
8	<i>Oryza sativa</i> 'Yaziai'	32	<i>Oryza sativa</i> 'Yangbainuo'	56	<i>Oryza sativa</i> 'Huangzhu'
9	<i>Oryza sativa</i> 'Aijiaotangzhu'	33	<i>Oryza sativa</i> 'Hongmizai'	57	<i>Oryza sativa</i> 'Red Dusk Grain'
10	<i>Oryza sativa</i> 'Younong'	34	<i>Oryza sativa</i> 'Youxi red'	58	<i>Oryza sativa</i> 'Gaojiaochi'
11	<i>Oryza sativa</i> 'Youcao'	35	<i>Oryza sativa</i> 'Yezhupao'	59	<i>Oryza sativa</i> 'Chimi'
12	<i>Oryza sativa</i> 'Zhaiyeqing'	36	<i>Oryza sativa</i> 'Kegu'	60	<i>Oryza sativa</i> 'Youxiyuhu'
13	<i>Oryza sativa</i> 'Keqing3hao'	37	<i>Oryza sativa</i> 'Shangdongbai'	61	<i>Oryza sativa</i> 'Dikoushanhe'
14	<i>Oryza sativa</i> 'Guangchangai'	38	<i>Oryza sativa</i> 'Fenlongzao'	62	<i>Oryza sativa</i> 'Nanpinghongmizai'
15	<i>Oryza sativa</i> 'Tieguai'	39	<i>Oryza sativa</i> 'Huakebai'	63	<i>Oryza sativa</i> 'Taijiang No.1'
16	<i>Oryza sativa</i> 'Guangjie No.9'	40	<i>Oryza sativa</i> 'Hongkoubai'	64	<i>Oryza sativa</i> 'Minhan No.1'
17	<i>Oryza sativa</i> 'Erjiuai'	41	<i>Oryza sativa</i> 'Hiyuezao'	65	<i>Oryza sativa</i> 'Minhan No.11'
18	<i>Oryza sativa</i> 'Qingxiaojinza'	42	<i>Oryza sativa</i> 'Jinhong'	66	<i>Oryza sativa</i> 'Minhan No.4'
19	<i>Oryza sativa</i> 'Zhenzhuai'	43	<i>Oryza sativa</i> 'Zhuhong'	67	<i>Oryza sativa</i> 'Minhan No.2'
20	<i>Oryza sativa</i> 'Decaihao'	44	<i>Oryza sativa</i> 'Milaxuan'	68	<i>Oryza sativa</i> 'Hanzao No.3'
21	<i>Oryza sativa</i> 'Shajing'	45	<i>Oryza sativa</i> 'Kuilibxuan'	69	<i>Oryza sativa</i> 'Tuoronghannuo'
22	<i>Oryza sativa</i> 'White Jade Grain'	46	<i>Oryza sativa</i> 'Kuifu3hao'	70	<i>Oryza sativa</i> 'Bazza ludao'
23	<i>Oryza sativa</i> 'Garnet red'	47	<i>Oryza sativa</i> 'Hongyun33'	71	<i>Oryza sativa</i> 'Shaxianshu'
24	<i>Oryza sativa</i> 'Baitoulian'	48	<i>Oryza sativa</i> '474'	72	<i>Oryza sativa</i> 'Guicao'

**Table 2: List of Hybrid Rice Varieties Planted in Lianhe Terrace**

Serial No	Scientific Name	Serial No	Scientific Name	Serial No	Scientific Name
73	<i>Oryza sativa</i> 'You I 66'	101	<i>Oryza sativa</i> 'Dqibaoyou 527'	129	<i>Oryza sativa</i> 'Liangyouhang No.2'
74	<i>Oryza sativa</i> 'Xinxiangyou80'	102	<i>Oryza sativa</i> 'II youhang148'	130	<i>Oryza sativa</i> 'Liangyou 1019'
75	<i>Oryza sativa</i> 'T you 537'	103	<i>Oryza sativa</i> 'II you936'	131	<i>Oryza sativa</i> 'Donglian No.5'
76	<i>Oryza sativa</i> 'II you 129'	104	<i>Oryza sativa</i> 'Dou No.6'	132	<i>Oryza sativa</i> 'II you 356'
77	<i>Oryza sativa</i> 'Teyou 009'	105	<i>Oryza sativa</i> 'II you 536'	133	<i>Oryza sativa</i> 'Teyou 180'
78	<i>Oryza sativa</i> 'Jinyou 07'	106	<i>Oryza sativa</i> 'Teyou 627'	134	<i>Oryza sativa</i> 'Guyou 5138'
79	<i>Oryza sativa</i> 'Jinfu I you150'	107	<i>Oryza sativa</i> 'Gangyou 527'	135	<i>Oryza sativa</i> 'Tianyou 3229'



80	<i>Oryza sativa</i> 'Teyou 716'	108	<i>Oryza sativa</i> 'II you3229'	136	<i>Oryza sativa</i> 'Guangyouming 118'
81	<i>Oryza sativa</i> 'Jinyou 1398'	109	<i>Oryza sativa</i> 'Luxiangyou 1256'	137	<i>Oryza sativa</i> 'II you 039'
82	<i>Oryza sativa</i> 'You I 028'	110	<i>Oryza sativa</i> 'II you339'	138	<i>Oryza sativa</i> 'Guyou 3301'
83	<i>Oryza sativa</i> 'Zhongyou 2115'	111	<i>Oryza sativa</i> 'Dyou 368'	139	<i>Oryza sativa</i> 'Jinnong 2 you 3'
84	<i>Oryza sativa</i> 'Minfengyou 3301'	112	<i>Oryza sativa</i> 'II youming118'	140	<i>Oryza sativa</i> 'Qiyou 125'
85	<i>Oryza sativa</i> 'Xianyou 161'	113	<i>Oryza sativa</i> 'Teyou 103'	141	<i>Oryza sativa</i> 'Guyou 769'
86	<i>Oryza sativa</i> 'Xinxiangyou 80'	114	<i>Oryza sativa</i> 'Chuanyou No.12'	142	<i>Oryza sativa</i> 'Jiangyouming 62'
87	<i>Oryza sativa</i> 'Jinliangyou No.4'	115	<i>Oryza sativa</i> 'T55you 627'	143	<i>Oryza sativa</i> 'Teyou 923'
88	<i>Oryza sativa</i> 'Quanzhen No.10'	116	<i>Oryza sativa</i> 'Gangyou164'	144	<i>Oryza sativa</i> 'Dyou 68'
89	<i>Oryza sativa</i> 'Jiafuzhan'	117	<i>Oryza sativa</i> 'Ilyou 3301'	145	<i>Oryza sativa</i> 'Guyou 527'
90	<i>Oryza sativa</i> 'Jiazao1hao'	118	<i>Oryza sativa</i> 'neiyouhang 148'	146	<i>Oryza sativa</i> 'II you 131'
91	<i>Oryza sativa</i> 'Dongnan 201'	119	<i>Oryza sativa</i> 'II you 673'	147	<i>Oryza sativa</i> 'Yueyou 9113'
92	<i>Oryza sativa</i> 'Zhangjiazao No.1'	120	<i>Oryza sativa</i> 'E II you315'	148	<i>Oryza sativa</i> 'Leyou 94'
93	<i>Oryza sativa</i> 'Dyouduoxi No.1'	121	<i>Oryza sativa</i> 'Ilyou516'	149	<i>Oryza sativa</i> 'Yyou No.6'
94	<i>Oryza sativa</i> 'Dyou 527'	122	<i>Oryza sativa</i> 'Tianyou 3301'	150	<i>Oryza sativa</i> 'V youhongtian'
95	<i>Oryza sativa</i> 'Teyouhang No.1'	123	<i>Oryza sativa</i> 'II you 6019'	151	<i>Oryza sativa</i> 'Siyouhongtiangu'
96	<i>Oryza sativa</i> 'II youfu819'	124	<i>Oryza sativa</i> 'Tianyou No.10'	152	<i>Oryza sativa</i> 'Siyou 30'
97	<i>Oryza sativa</i> 'II youhang No.1'	125	<i>Oryza sativa</i> 'II youming 118'	153	<i>Oryza sativa</i> 'Siyou Indonesia aishu'
98	<i>Oryza sativa</i> 'V II you183'	126	<i>Oryza sativa</i> 'Teyou 103'	154	<i>Oryza sativa</i> 'Xianyou 63'
99	<i>Oryza sativa</i> 'II you1273'	127	<i>Oryza sativa</i> 'II youshun 98'	155	<i>Oryza sativa</i> 'Siyou No.6'
100	<i>Oryza sativa</i> 'Teyou 671'	128	<i>Oryza sativa</i> 'Liangyou 3773'	156	<i>Oryza sativa</i> 'Xianyou No.6'

**Table 3: List of Other Agricultural Living Species in Lianhe Terrace**

Serial No	Scientific Name	Classification	Serial No	Scientific Name	Classification
1	<i>Misgurnus anguillicaudatus.</i>	Invertebrates	86	<i>Arachis</i> 'Baisha 18792'	Oil crops
2	<i>Monopterus albus.</i>	Invertebrates	87	<i>Arachis</i> 'Yueyou169'	Oil crops
3	<i>Ctenopharyngodon idellus.</i>	Invertebrates	88	<i>Brassica</i> 'Fuyou No.4'	Oil crops
4	<i>Cyprinus carpio.</i>	Invertebrates	89	<i>Manihot esculenta crantz.</i>	Oil crops
5	<i>Hypophthalmichthys molitrix.</i>	Invertebrates	90	<i>Brassica</i> 'Huanan8641'.	Oil crops
6	<i>Aristichthys nobilis Richardson.</i>	Invertebrates	91	<i>Helianthus annuus</i> 'Xiangyang'	Oil crops
7	<i>Fenneropenaeus chinensis.</i>	Invertebrates	92	<i>Helianthus annuus</i> 'Huafexian zi'	Oil crops
8	<i>Freshwater shrimps.</i>	Invertebrates	93	<i>Camellia oleifera.</i>	Oil crops
9	<i>E.carinicauda.</i>	Invertebrates	94	<i>C.meiocarpa.</i>	Oil crops
10	<i>Cipangopaludina cahayensis.</i>	Invertebrates	95	<i>Camellia oleifera</i> 'Youxian'	Oil crops
11	<i>Rivalaria auriculata (Martens)</i>	Invertebrates	96	<i>Anneslea fragrans</i> Wall.	Oil crops
12	<i>Freshwater crab.</i>	Invertebrates	97	<i>Tephrosia ionophlebia.</i>	Vegetable crops
13	<i>Sus domesticus</i> 'Tai hu'	Vertebrate	98	<i>Phaseolus vulgaris</i> Linn.	Vegetable crops
14	<i>Sus domesticus</i> 'Minbeihua'.	Vertebrate	99	<i>Lablab purpureus</i> (Linn.) Sweet.	Vegetable crops
15	<i>Sus domesticus</i> 'Huai' .	Vertebrate	100	<i>Vicia faba</i> L.	Vegetable crops
16	<i>Sus domesticus</i> 'Er yuan'.	Vertebrate	101	<i>Pisum sativum var. saccharatum.</i>	Vegetable crops
17	<i>Sus domesticus</i> 'Chang white'.	Vertebrate	102	<i>Vigna unguiculata.</i>	Vegetable crops
18	<i>Leporidae sinensis.</i>	Vertebrate	103	<i>Lathyrusodoratus</i> L.	Vegetable crops
19	<i>Leporidae brachyurus.</i>	Vertebrate	104	<i>Phaseolus vulgaris</i> 'Qing dao'.	Vegetable crops
20	<i>Oryctolagus cuniculus.</i>	Vertebrate	105	<i>Adenanthera pavonina</i> Linn. var. <i>microsperma.</i>	Vegetable crops
21	<i>Leporidae saxatilis.</i>	Vertebrate	106	<i>Zingiber officinale</i> 'Taiwan'.	Vegetable crops
22	<i>Leporidae</i> 'Belgian'.	Vertebrate	107	<i>Capsicum annum</i> L.	Vegetable crops
23	<i>Leporidae</i> 'New Zealand white'.	Vertebrate	108	<i>Capsicum annum</i> 'Xiao mi'.	Vegetable crops
24	<i>Capra</i> 'Dai yun'.	Vertebrate	109	<i>Asparagus officinalis.</i>	Vegetable crops
25	<i>Capra</i> 'Nanjiang yellow'.	Vertebrate	110	<i>Lactuca sativa</i> L.var. <i>angustana</i> Irish.	Vegetable crops
26	<i>Capra</i> 'Boer'.	Vertebrate	111	<i>Colocasia esculenta</i> (L.) Schoot.	Vegetable crops
27	<i>Holstein cows.</i>	Vertebrate	112	<i>Sechium edule.</i>	Vegetable crops
28	<i>Bubalus bubalus.</i>	Vertebrate	113	<i>Luffa cylindrical.</i>	Vegetable crops
29	<i>Canis lupus</i> 'Youxi'.	Vertebrate	114	<i>Lagenaria siceraria</i> (Molina) Standl.	Vegetable crops
30	<i>Canis lupus familiaris</i> .	Vertebrate	115	<i>Cucumis sativus</i> Linn.	Vegetable crops
31	<i>Wolfhound.</i>	Vertebrate	116	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poiret.	Vegetable crops
32	<i>Gallus domesticaus</i> 'Youxi'.	Vertebrate	117	<i>Benincasa hispida</i> (Thunb.) Cogn.	Vegetable crops
33	<i>Gallus domesticaus</i> 'Yinxing white'.	Vertebrate	118	<i>Balsam pear.</i>	Vegetable crops
34	<i>Gallus domesticaus</i> 'Fuzhou rong quan'.	Vertebrate	119	<i>Cleome gynandra</i> 'Qing nong qing'.	Vegetable crops
35	<i>Gallus domesticaus</i> 'Shanghaijinshan'.	Vertebrate	120	<i>Cleome gynandra</i> 'Lv xiu qing'.	Vegetable crops
36	<i>Gallus domesticaus</i> 'Red pineapple'.	Vertebrate	121	<i>Solanum melongena.</i>	Vegetable crops
37	<i>Gallus domesticaus</i> 'Isa brown'.	Vertebrate	122	<i>Lycopersicon esculentum</i> Mill.	Vegetable crops
38	<i>Gallus domesticaus</i> 'San huang'.	Vertebrate	123	<i>Allium fistulosum.</i>	Vegetable crops

39	<i>Tadorna</i> 'Shanma'.	Vertebrate	124	<i>Allium cepa</i> .	Vegetable crops
40	<i>Melanitta</i> 'Banfan'.	Vertebrate	125	<i>Allium sativum</i> 'Zipi'.	Vegetable crops
41	<i>Melanitta</i> 'Fan'.	Vertebrate	126	<i>A. tuberosum</i> Rottl. ex Spreng.	Vegetable crops
42	<i>Cygnus</i> 'Shitou'.	Vertebrate	127	<i>Spinacia oleracea</i> L.	Vegetable crops
43	<i>Cygnus</i> 'Chinese'.	Vertebrate	128	<i>Brassica oleracea</i> var. <i>capitata</i> .	Vegetable crops
44	<i>Cygnus</i> 'Changle'.	Vertebrate	129	<i>Brassica pekinensis</i> 'Aijiaonai'.	Vegetable crops
45	<i>Columba</i> 'Wang'.	Vertebrate	130	<i>Brassica chinensis</i> 'Xing hua'.	Vegetable crops
46	<i>Columba</i> 'Xin'.	Vertebrate	131	<i>Amaranthus tricolor</i> L.	Vegetable crops
47	<i>Dioscorea</i> 'Jinshan 57'.	Food crops	132	<i>Capsella bursa-pastoris</i> .	Vegetable crops
48	<i>Dioscorea</i> 'Fuzhu 75-55'.	Food crops	133	<i>Apium graveolens</i> Linn.	Vegetable crops
49	<i>Dioscorea</i> 'Tuodujinshan 57'.	Food crops	134	<i>Raphanus sativus</i> .	Vegetable crops
50	<i>Dioscorea</i> 'Yanshu5hao'.	Food crops	135	<i>Daucus carota</i> .	Vegetable crops
51	<i>Solanum</i> 'Kexin No.1'.	Food crops	136	<i>Zizania latifolia</i> (Griseb.) Stapf.	Vegetable crops
52	<i>Solanum</i> 'Kexin No.2'.	Food crops	137	<i>Nelumbo nucifera</i> Gaertn.	Vegetable crops
53	<i>Solanum</i> 'Kexin No.3'.	Food crops	138	<i>Sonchus brachyotus</i> D C.	Vegetable crops
54	<i>Solanum</i> 'Kexin No.9'.	Food crops	139	<i>Brassica oleracea</i> L.	Vegetable crops
55	<i>Solanum</i> 'Kexin No.11'.	Food crops	140	<i>Ipomoea aquatica</i> Forsk.	Vegetable crops
56	<i>Solanum</i> 'Zhongshu No. 3'	Food crops	141	<i>Astragalus sinicus</i> 'minzi No.1'	Vegetable crops
57	<i>Solanum</i> 'Qingshu No.4'	Food crops	142	<i>Astragalus sinicus</i> 'minzi No.5'	Vegetable crops
58	<i>Solanum</i> 'Zheng shu No.5'	Food crops	143	<i>Astragalus sinicus</i> 'minzi No.6'	Vegetable crops
59	<i>Solanum</i> 'Netherlands 14'.	Food crops	144	<i>Astragalus sinicus</i> 'minzi No.7'	Vegetable crops
60	<i>Solanum</i> 'Zaodabai'.	Food crops	145	<i>Saccharum officinarum</i> 'tang'.	Economic crops
61	<i>Solanum</i> 'Canada red ya'.	Food crops	146	<i>Saccharum officinarum</i> 'Guo'.	Economic crops
62	<i>Solanum</i> 'American red skin'.	Food crops	147	<i>Boehmeria nivea</i> (L.) Gaudich.	Economic crops
63	<i>Solanum</i> 'Virus-free'.	Food crops	148	<i>Corchorus capsularis</i> L.	Economic crops
64	<i>Zea mays</i> 'Danyu 13'	Food crops	149	<i>Juncus effusus</i> L.	Economic crops
65	<i>Zea mays</i> 'Yedan No.1'	Food crops	150	<i>Camellia japonica</i> L.	Economic crops
66	<i>Zea mays</i> 'Baiding No.1'	Food crops	151	<i>Nicotiana tabacum</i> .	Economic crops
67	<i>Zea mays</i> 'Shuitian No.1'	Food crops	152	<i>Citrus maxima</i> (Burm.) Merr. cv. Shatian Yu.	Fruit crops
68	<i>Zea mays</i> 'Aotianluno No.1'	Food crops	153	<i>Citrus grandis</i> (L.) Osbeck cv. Guanxi-miyou.	Fruit crops
69	<i>Zea mays</i> 'Shunuo No.1'	Food crops	154	<i>Citrus grandis</i> 'Candler'.	Fruit crops
70	<i>Zea mays</i> 'Zhenuo No.1'	Food crops	155	<i>Citrus L.</i> 'Youxi'.	Fruit crops
71	<i>Zea mays</i> 'Minzinuo78-1'.	Food crops	156	<i>Citrus sinensis</i> (L.) Osbeck.	Fruit crops
72	<i>Zea mays</i> 'Minnuo 98-1'.	Food crops	157	<i>Fortunella margarita</i> (Lour. ) Swingle.	Fruit crops
73	<i>Zea mays</i> 'Minzinuo No.1'	Food crops	158	<i>Kaempferia galanga</i> .	Fruit crops
74	<i>Glycine max</i> 'Pudou 8008'	Oil crops	159	<i>Prunus salicina</i> 'furong'.	Fruit crops
75	<i>Glycine max</i> 'American yellow'.	Oil crops	160	<i>Vitis vinifera</i> .	Fruit crops
76	<i>Glycine max</i> 'Zhechun No.2'	Oil crops	161	<i>Eriobotrya japonica</i> .	Fruit crops
77	<i>Glycine max</i> 'Zhechun No.3'	Oil crops	162	<i>Mushrooms</i> .	Edible fungus
78	<i>Glycine max</i> 'Gengqing 82'.	Oil crops	163	<i>Dictyophora indusiata</i> .	Edible fungus
79	<i>Glycine max</i> 'Chi'.	Oil crops	164	<i>Agaricus blazei murrill</i> .	Edible fungus
80	<i>Glycine max</i> 'He'.	Oil crops	165	<i>Agrocybe aegirit</i> 'Chaxin3hao'.	Edible fungus
81	<i>Glycine max</i> 'Guanyingshui'.	Oil crops	166	<i>Ganoderma lucidum</i> 'Chi No.6'	Edible fungus
82	<i>Helicteres angustifolia</i> Linn.	Oil crops	167	<i>Antrodia camphorata</i> 'yuan No. 8'	Edible fungus
83	<i>Helicteres viscida</i> Blume.	Oil crops	168	<i>Pleurotus sajor-caju</i> (Fr.) Singer.	Edible fungus
84	<i>Arachis</i> 'Xiaoliuqiu'.	Oil crops	169	<i>Lentinus edodes</i> 'L66'.	Edible fungus
85	<i>Arachis</i> 'Baisha1016'.	Oil crops	170	<i>Lentinus edodes</i> 'L26'.	Edible fungus

## 2. List of plant in Lianhe Terrace

Table 4: List of Plant in Lianhe Terrace

No	Family	Genus	Species	Distribution area
1	<i>Haloragidaceae</i>	<i>Myriophyllum</i> .	<i>Myriophyllum verticillatum</i>	Terraces/Stream
2	<i>Bryaceae</i>	<i>Rhodobryum</i>	<i>Rhodobryum roseum</i>	Forest/Village/Terraces/Stream
3	<i>Pottiaceae</i>	<i>Tortula</i> Hedw	<i>Tortula sinensis</i> (C. Muell.) Broth.	Forest/Village/Terraces/Stream
4	<i>Funariaceae</i>	<i>Funaria</i>	<i>Funaria hygrometrica</i>	Forest/Village/Stream
5	<i>Hypnaceae</i>	<i>Hypnum</i>	<i>Hypnum plumaeforme</i>	Forest/Village/Terraces/Stream
6	<i>Sphagnaceae</i>	<i>Sphagnum</i>	<i>Sphagnum cymbifolium</i> .	Forest/Village/Stream
7	<i>Marchantiaceae</i>	<i>Marchantia</i>	<i>Marchantia polymorpha</i> L.	Forest/Village/Terraces/Stream
8	<i>Mniaceae</i>	<i>Plagiomnium</i>	<i>Plagiomnium cuspidatum</i>	Forest/Village

9	<i>Lycopodiaceae</i>	<i>Lycopodiastrium</i> Holub.	<i>Lycopodium casuarinoides</i> .	Forest/Village
10	<i>Equisetaceae</i>	<i>Equisetum</i>	<i>Hippochaete hiemale</i> L.	Forest/Terraces/Village /Stream
11	<i>Dicksoniaceae</i>	<i>Cibotium</i>	<i>Cibotium barometz</i>	Forest
12	<i>Pteridaceae</i>	<i>Pteris</i> L.	<i>Pteris semipinnata</i> L.	Forest/Village /Stream
13	<i>Pteridaceae</i>	<i>Pteris</i> L.	<i>Pteris multifida</i>	Forest/Village /Terraces/Stream
14	<i>Pteridaceae</i>	<i>Pteris</i> L.	<i>Pteris ensiformis</i> Burm.	Forest/Village /Stream
15	<i>Davalliaceae</i>	<i>Nephrolepis</i>	<i>Nephrolepis cordifolia</i> L.	Forest/Terraces/Village /Stream
16	<i>Davalliaceae</i>	<i>Humata</i>	<i>Humata tyermannii</i>	Forest/Village /Stream
17	<i>Lygodiaceae</i>	<i>Lygodium</i> Sw.	<i>Lygodium japonicum</i> T.	Forest/Terraces/Village /Stream
18	<i>Drynariaceae</i>	<i>Drynaria</i> .	<i>Drynaria roosii</i> .	Forest/Terraces/Village /Stream
19	<i>Thelypteridaceae</i>	<i>Parathelypteris</i>	<i>Parathelypteris glanduligera</i>	Forest/Village /Stream
20	<i>Angiopteridaceae</i>	<i>Angiopteris</i>	<i>Angiopteris fokiensis</i> H.	Forest
21	<i>Dryopteridaceae</i>	<i>Cyrtomium</i> Presl.	<i>Cyrtomium balansae</i> C.	Forest
22	<i>Polypodiaceae</i>	<i>Microsorium</i>	<i>Microsorium fortunei</i> T.	Forest/Village /Stream
23	<i>Polypodiaceae</i>	<i>Pyrrosia</i> Mirbel.	<i>Pyrrosia lingua</i> T.	Forest/Village /Stream
24	<i>Polypodiaceae</i>	<i>Colysis</i> C. Presl.	<i>Colysis elliptica</i> T.	Forest/Village
25	<i>Polypodiaceae</i>	<i>Lepisorus</i> (J. Sm.) Ching.	<i>Lepisorus thunbergianus</i>	Forest/Village
26	<i>Aspleniaceae</i>	<i>Asplenium</i>	<i>Asplenium trichomanes</i> L.	Forest/Village
27	<i>Adiantaceae</i>	<i>Adiantum</i> L.	<i>Adiantum capillusveneris</i> L.	Forest/Village /Stream
28	<i>Blechnaceae</i>	<i>Blechnum</i> L.	<i>Blechnum orientale</i> L.	Forest/Village
29	<i>Gleicheniaceae</i>	<i>Hicriopteris</i>	<i>Hicriopteris glauca</i> .	Forest
30	<i>Gleicheniaceae</i>	<i>Hicriopteris</i>	<i>Diplopterygium chinense</i>	Forest
31	<i>Gleicheniaceae</i>	<i>Dicranopteris</i> Bernh.	<i>Dicranopteris dichotoma</i>	Forest/Village /Stream
32	<i>Selaginellaceae</i>	<i>Selaginella</i>	<i>Selaginella moellendorffii</i>	Forest/Village
33	<i>Selaginellaceae</i>	<i>Selaginella</i>	<i>Selaginella uncinata</i>	Forest/Village /Stream
34	<i>Selaginellaceae</i>	<i>Selaginella</i>	<i>Selaginella kranstiana</i>	Forest/Village
35	<i>Selaginellaceae</i>	<i>Selaginella</i>	<i>Selaginella doederleinii</i>	Forest/Village
36	<i>Selaginellaceae</i>	<i>Selaginella</i>	<i>Selaginella nipponica</i> F.	Forest/Village
37	<i>Cycasaceae</i>	<i>Cycas</i> Linn.	<i>Cycas revoluta</i> Thunb.	Village /Stream
38	<i>Ginkgoaceae</i>	<i>Ginkgo</i>	<i>Ginkgo biloba</i> L.	Forest/Terraces/Village /Stream
39	<i>Pinaceae</i>	<i>Keteleeria</i>	<i>Keteleeria fortunei</i>	Forest
40	<i>Pinaceae</i>	<i>Keteleeria</i>	<i>Keteleeria cyclolepis</i> Flous.	Forest
41	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus massoniana</i> Lamb.	Forest
42	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus taiwanensis</i> Hayata.	Forest
43	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus palustris</i> Mill.	Forest
44	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus taeda</i> L.	Forest
45	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus elliotii</i> .	Forest
46	<i>Pinaceae</i>	<i>Pinus</i> Linn.	<i>Pinus pinaster</i> Ait.	Forest
47	<i>Taxodiaceae</i>	<i>Cryptomeria</i>	<i>C.fortunei</i> Hooibrenk.ex Otto et Dietr.	Forest/Village
48	<i>Taxodiaceae</i>	<i>Taxodium</i>	<i>Taxodium ascendens</i> .	Village /Stream
49	<i>Taxodiaceae</i>	<i>Cunninghamia</i>	<i>Cunninghamia lanceolata</i>	Forest/Village
50	<i>Cupressaceae</i>	<i>Cupressus</i>	<i>Cupressus funebris</i> Endl.	Village
51	<i>Cupressaceae</i>	<i>Sabina</i>	<i>Sabina chinensis</i>	Village
52	<i>Cupressaceae</i>	<i>Juniperus</i>	<i>Juniperus formosana</i> Hayata.	Village
53	<i>Cupressaceae</i>	<i>Fokienia</i>	<i>Fokienia hodginsii</i>	Village /Terraces
54	<i>Cupressaceae</i>	<i>Platykladus</i>	<i>Platykladus orientalis</i>	Village
55	<i>Cephalotaxaceae</i>	<i>Cephalotaxus</i>	<i>Cephalotaxus fortunei</i> Hook.	Forest/Village /Stream
56	<i>Taxaceae</i>	<i>Taxus</i> Linn.	<i>Taxus chinensis</i>	Forest/Village
57	<i>Taxaceae</i>	<i>Torreya</i> Arn.	<i>Torreya grandis</i>	Forest/Village
58	<i>Taxaceae</i>	<i>Taxus</i> Linn.	<i>Taxus mairei</i> S.	Forest/Village
59	<i>Gnetaceae</i> Lind L.	<i>Gnetum</i> L.	<i>Gnetum parvifolium</i> W.	Forest
60	<i>Magnoliaceae</i>	<i>Magnolia</i>	<i>Magnolia officinalis</i> R.	Forest
61	<i>Magnoliaceae</i>	<i>Magnolia</i>	<i>Magnolia officinalis</i> .	Forest
62	<i>Magnoliaceae</i>	<i>Magnolia</i>	<i>Magnolia grandiflora</i> L.	Village /Stream
63	<i>Magnoliaceae</i>	<i>Magnolia</i>	<i>Magnolia liliiflora</i> Desr.	Village
64	<i>Magnoliaceae</i>	<i>Magnolia</i>	<i>Magnolia soulangeana</i> S.	Stream
65	<i>Magnoliaceae</i>	<i>Tsoongiodendron</i> Chun.	<i>Michelia odora</i>	Forest
66	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Michelia velutina</i>	Village /Stream
67	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Michelia figo</i>	Forest/Village /Stream
68	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Michelia chapensis</i> Dandy.	Forest
69	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Michelia fujianensis</i>	Forest
70	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Michelia maudiae</i> Dunn.	Forest/Terraces/Village /Stream
71	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>Manglietia fordiana</i>	Forest
72	<i>Magnoliaceae</i>	<i>Michelia</i> Linn.	<i>M.foveolata</i> Merr.et Dandy.	Forest
73	<i>Campanulaceae</i>	<i>Codonopsis</i> Wall.	<i>Codonopsis pilosula</i>	Forest
74	<i>Gentianaceae</i>	<i>Gentiana</i> (Tourn.) L.	<i>Gentiana scabra</i> B.	Forest
75	<i>Gentianaceae</i>	<i>Gentiana</i> (Tourn.) L.	<i>Gentiana davidii</i> F.	Forest
76	<i>Magnoliaceae</i>	<i>Illicium</i> Linn.	<i>Illicium verum</i> Hook.f.	Forest/Village

77	Magnoliaceae	<i>Illicium</i> Linn.	<i>Illicium henryi</i>	Forest
78	Magnoliaceae	<i>Illicium</i> Linn.	<i>Illicium lanceolatum</i> A.C.Smith.	Forest
79	Schisandraceae	<i>Schisandra</i> Michx.	<i>Kadsura longipedunculata</i> Finet.	Forest
80	Annonaceae	<i>Fissistigma</i> Griff.	<i>Fissistigma uonicum</i>	Forest
81	Annonaceae	<i>Fissistigma</i> Griff.	<i>Fissistigma glaucescens</i>	Forest
82	Annonaceae	<i>Fissistigma</i> Griff.	<i>Fissistigma oldhamii</i>	Forest
83	Lauraceae	<i>Cinnamomum</i>	<i>Cinnamomum camphora</i>	Forest/Village /Stream
84	Lauraceae	<i>Cinnamomum</i>	<i>Cinnamomum burmanni</i>	Forest/Village /Stream
85	Lauraceae	<i>Cinnamomum</i>	<i>Cinnamomum subavenium</i> Miq	Forest/Village /Stream
86	Lauraceae	<i>Cinnamomum</i>	<i>Cinnamomum austrosinense</i>	Forest/Village
87	Lauraceae	<i>Machilus</i>	<i>Machilus thunbergii</i> Sieb.et Zucc.	Forest/Village
88	Lauraceae	<i>Phoebe</i> Nees.	<i>Phoebe bournei</i>	Forest
89	Lauraceae	<i>Neolitsea</i> Merr.	<i>Neolitsea aurata</i>	Forest
90	Lauraceae	<i>Neolitsea</i> Merr.	<i>Neolitsea aurata</i>	Forest
91	Lauraceae	<i>Litsea</i>	<i>Litsea cubeba</i>	Forest
92	Lauraceae	<i>Litsea</i>	<i>Litsea subcoriacea</i> Yang.	Forest
93	Lauraceae	<i>Litsea</i>	<i>Litsea greenmaniana</i>	Forest
94	Lauraceae	<i>Litsea</i>	<i>Litsea elongata</i>	Forest
95	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera megaphylla</i> Hemsl.	Forest
96	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera glauca</i>	Forest
97	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera angustifolia</i> Cheng.	Forest
98	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera nacusua</i>	Forest
99	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera communis</i> Hemsl.	Forest
100	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera aggregata</i>	Forest
101	Lauraceae	<i>Lindera</i> Thunb.	<i>Lindera megaphylla</i> Hemsl.	Forest
102	Violaceae	<i>Viola</i> L.	<i>Viola philippica</i> Car.	Terraces/Stream
103	Rosaceae	<i>Spiraea</i>	<i>Spiraea japonica</i> L. f.	Forest
104	Rosaceae	<i>Spiraea</i>	<i>Spiraea prunifolia</i> Sieb.	Forest
105	Rosaceae	<i>Rosa</i> L.	<i>Rosa laevigata</i> Michx.	Forest/Terraces/Village /Stream
106	Rosaceae	<i>Rosa</i> L.	<i>Rosa chinensis</i> Jacq.	Village /Stream
107	Rosaceae	<i>Rubus</i> L.	<i>Rubus innominatus</i> S. Moors.	Forest
108	Rosaceae	<i>Rubus</i> L.	<i>Rubus rosaefolius</i> Smith.	Forest/Village
109	Rosaceae	<i>Rubus</i> L.	<i>Rubus coreanus</i> Miq.	Terraces
110	Rosaceae	<i>Rubus</i> L.	<i>Rubus parvifolius</i> L.	Terraces/Village
111	Rosaceae	<i>Rubus</i> L.	<i>Rubus columellaris</i> Tutcher.	Forest/Village
112	Rosaceae	<i>Rubus</i> L.	<i>Rubus corchorifolius</i> L.	Forest
113	Rosaceae	<i>Rubus</i> L.	<i>Rubus swinhoei</i>	Forest
114	Rosaceae	<i>Rubus</i> L.	<i>Rubus chroosepalus</i> Focke.	Forest
115	Rosaceae	<i>Rubus</i> L.	<i>Rubus hanceanus</i> Ktze.	Forest
116	Rosaceae	<i>Rubus</i> L.	<i>Rubus lambertianus</i>	Forest
117	Rosaceae	<i>Rubus</i> L.	<i>Rubus irenaeus</i>	Forest
118	Rosaceae	<i>Rubus</i> L.	<i>Rubus buergeri</i> Miq.	Forest
119	Rosaceae	<i>Cerasus</i>	<i>Prunus phaeosticta</i> .	Forest
120	Rosaceae	<i>Laurocerasus</i>	<i>Laurocerasus zippeliana</i>	Forest/Village /Stream
121	Rosaceae	<i>Cerasus</i>	<i>Prunus spinulosa</i> S.	Forest
122	Rosaceae	<i>Cerasus</i>	<i>Cerasus pogonostyla</i> var. <i>obovata</i>	Forest
123	Rosaceae	<i>Cerasus</i>	<i>Prunus campanulata</i>	Forest
124	Rosaceae	<i>Prunus</i>	<i>Prunus salicina</i> Lindl.	Village
125	Rosaceae	<i>Prunus</i>	<i>Prunus Cerasifera</i> Ehrhar Rehd.	Village /Stream
126	Rosaceae	<i>Rubus</i> L.	<i>Rubus idaeus</i>	Forest/Stream
127	Rosaceae	<i>Armeniaca</i>	<i>Armeniaca mume</i> S.	Village
128	Rosaceae	<i>Photinia</i> Lindl.	<i>Photinia davidsoniae</i>	Forest
129	Rosaceae	<i>Amygdalus</i> L.	<i>Amygdalus persica</i> L.	Village /Stream
130	Rosaceae	<i>Photinia</i> Lindl.	<i>Photinia prunifolia</i> L.	Forest
131	Rosaceae	<i>Photinia</i> Lindl.	<i>Photinia serrulata</i> L.	Village /Stream
132	Rosaceae	<i>Photinia</i> Lindl.	<i>Photinia glabra</i> .	Forest
133	Rosaceae	<i>Photinia</i> Lindl.	<i>Photinia parvifolia</i> S.	Forest/Village
134	Rosaceae	<i>Eriobotrya</i> Lindl.	<i>Eriobotrya japonica</i> L.	Village /Stream
135	Rosaceae	<i>Rhaphiolepis</i>	<i>Rhaphiolepis ferruginea</i> M.	Forest
136	Rosaceae	<i>Rhaphiolepis</i>	<i>Rhaphiolepis indica</i> L.	Forest
137	Rosaceae	<i>Pygeum</i> L.	<i>Pygeum topengii</i>	Forest
138	Rosaceae	<i>Pyrus</i>	<i>Pyrus serotina</i>	Village
139	Rosaceae	<i>Pyrus</i>	<i>Pyrus calleryana</i> D.	Village
140	Rosaceae	<i>Malus</i>	<i>Malus hupehensis</i> R.	Village /Stream
141	Rosaceae	<i>Chimonanthus</i>	<i>Chimonanthus praecox</i> L.	Village /Stream
142	Rosaceae	<i>Cydonia</i>	<i>Cydonia oblonga</i>	Forest
143	Droseraceae	<i>Drosera</i> L.	<i>Drosera</i> .	Forest
144	Droseraceae	<i>Drosera</i> L.	<i>Drosera pelata</i>	Forest

145	<i>Leguminosae</i>	<i>Cassia</i>	<i>Senna surattensis</i>	Forest/Stream
146	<i>Leguminosae</i>	<i>Cassia</i>	<i>Cassia obtusifolia</i>	Forest/Stream
147	<i>Leguminosae</i>	<i>Bauhinia</i>	<i>Bauhinia championii</i>	Forest/Village
148	<i>Leguminosae</i>	<i>Acacia</i> Mill.	<i>Acacia confuse</i>	Forest
149	<i>Leguminosae</i>	<i>Mimosa</i> Linn.	<i>Mimosa pudica</i> Linn.	Forest/Village
150	<i>Leguminosae</i>	<i>Albizia</i> Durazz.	<i>Albizia kalkora</i>	Forest
151	<i>Leguminosae</i>	<i>Crotalaria</i> Linn.	<i>Crotalaria pallida</i> Ait.	Forest/Terraces/Village /Stream
152	<i>Leguminosae</i>	<i>Mucuna</i> Adans.	<i>Mucuna Evergreen.</i>	Forest/Terraces/Village /Stream
153	<i>Leguminosae</i>	<i>Desmodium</i> Desv.	<i>Desmodium heterocarpon</i>	Forest/Terraces/Village /Stream
154	<i>Leguminosae</i>	<i>Desmodium</i> Desv.	<i>Desmodium racemosum</i> Thunb.	Forest/Terraces/Village /Stream
155	<i>Leguminosae</i>	<i>Lespedeza</i> Michx.	<i>Lespedeza bicolor</i> Turcz.	Forest
156	<i>Leguminosae</i>	<i>Lespedeza</i> Michx.	<i>Lespedeza formosa</i>	Forest
157	<i>Leguminosae</i>	<i>Dalbergia</i> Linn.	<i>Dalbergia hupeana</i> Hance.	Forest
158	<i>Leguminosae</i>	<i>Vicia</i>	<i>Vicia sepium</i> Linn.	Terraces/Village /Stream
159	<i>Leguminosae</i>	<i>Pueraria</i>	<i>Pueraria lobata</i>	Forest/Village
160	<i>Leguminosae</i>	<i>Derris</i>	<i>Derris fordii</i> Oliv.	Forest
161	<i>Leguminosae</i>	<i>Millettia</i>	<i>Millettia dielsiana</i> Harms.	Forest
162	<i>Leguminosae</i>	<i>Vigna</i> Savi.	<i>Vigna unguiculata</i>	Terraces/Village
163	<i>Leguminosae</i>	<i>Pisum</i>	<i>Pisum sativum</i> L.	Terraces/Village
164	<i>Leguminosae</i>	<i>Glycine</i> Willd.	<i>Glycine max</i>	Terraces/Village
165	<i>Leguminosae</i>	<i>Vicia</i>	<i>Vicia faba</i> L.	Terraces/Village
166	<i>Leguminosae</i>	<i>Lablab</i>	<i>Lablab purpureus</i>	Terraces/Village
167	<i>Leguminosae</i>	<i>Pisum</i>	<i>Pisum sativum</i>	Terraces/Village
168	<i>Leguminosae</i>	<i>Vigna</i> Savi.	<i>Vigna radiata</i>	Terraces/Village
169	<i>Leguminosae</i>	<i>Adenanthera</i>	<i>Adenanthera pavonina</i>	Terraces/Village
170	<i>Leguminosae</i>	<i>Arachis</i>	<i>Arachis duranensis</i>	Forest/Terraces/Village /Stream
171	<i>Leguminosae</i>	<i>Arachis</i>	<i>Arachis hypogaea</i> Linn.	Terraces/Village
172	<i>Leguminosae</i>	<i>Phaseolus</i> L.	<i>Phaseolus vulgaris</i> L.	Terraces/Village
173	<i>Papilionoideae</i>	<i>Ormosia</i> G.	<i>Ormosia henryi</i> Prain.	Terraces/Village /Stream
174	<i>Papilionoideae</i>	<i>Dalbergia</i> Linn.	<i>Dalbergia hancei</i> Benth.	Forest
175	<i>Potamogetonaceae</i>	<i>Potamogeton</i>	<i>Potamogeton franchetii</i>	Forest/Village /Terraces/Stream
176	<i>Guttiferae</i>	<i>Hypericum</i> Linn.	<i>Hypericum japonicum.</i>	Forest/Stream
177	<i>Guttiferae</i>	<i>Garcinia</i>	<i>Garcinia oblongifolia</i> Champ.	Forest
178	<i>Saxifragaceae</i>	<i>Hydrangea</i> L.	<i>Hydrangea chungii</i> Rehd.	Forest/Village
179	<i>Saxifragaceae</i>	<i>Hydrangea</i> L.	<i>Hydrangea macrophylla</i> (Thunb.) Ser.	Forest/Village
180	<i>Saxifragaceae</i>	<i>Hydrangea</i> L.	<i>H.lingii</i> Hoo.	Forest
181	<i>Saxifragaceae</i>	<i>Hydrangea</i> L.	<i>Hydrangea paniculata</i> S.	Forest
182	<i>Saxifragaceae</i>	<i>Itea</i>	<i>Itea chinensis</i> Hook.	Forest
183	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax odoratissimus</i> Champ.	Forest
184	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax confuses</i>	Forest
185	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax dasyanthus</i> Perk.	Forest
186	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax faberi</i>	Forest
187	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax tonkinensis</i>	Forest
188	<i>Styracaceae</i>	<i>Styrax</i> Linn.	<i>Styrax suberifolius</i> Hook.	Forest
189	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos sumuntia</i>	Forest
190	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos tetragona</i> Chen.	Forest
191	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos setchuensis</i> Brand.	Forest
192	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos chinensis</i>	Forest
193	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos paniculata</i> (Thunb.) Miq.	Forest
194	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos stellaris</i> Brand.	Forest
195	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos wikstroemiiifolia</i> Hayata.	Forest
196	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos mollifolia</i> Dunn.	Forest
197	<i>Symplocaceae</i>	<i>Symplocos</i>	<i>Symplocos lancifolia</i> Sieb.	Forest
198	<i>Alangiaceae</i>	<i>Alangium</i>	<i>Alangium platanifolium</i> Sieb.	Forest
199	<i>Alangiaceae</i>	<i>Alangium.</i>	<i>Alangium chinense</i> (Lour. )Harms	Forest/Terraces/Stream
200	<i>Alangiaceae</i>	<i>Alangium.</i>	<i>Alangium kurzii</i> Craib	Forest/Terraces
201	<i>Altingiaceae</i> Lindl	<i>Semiliquidambar</i>	<i>Emiliquidambar caudata</i> Chang.	Forest/Terraces/Village
202	<i>Altingiaceae</i> Lindl	<i>Semiliquidambar</i>	<i>Liquidambar formosana</i> Hance.	Forest/Terraces/Village /Stream
203	<i>Araliaceae</i>	<i>Aralia</i> Linn.	<i>Aralia spinifolia</i> Merr.	Forest
204	<i>Araliaceae</i>	<i>Aralia</i> Linn.	<i>Aralia decaisneana</i> Hance.	Forest
205	<i>Araliaceae</i>	<i>Aralia</i> Linn.	<i>Aralia dasyphylla</i> Miq.	Forest
206	<i>Araliaceae</i>	<i>Schefflera</i>	<i>Schefflera octophylla</i> (Lour.) Harms.	Forest
207	<i>Araliaceae</i>	<i>Heteropanax</i> Seem.	<i>Heteropanax fragrans</i>	Forest/Village
208	<i>Caprifoliaceae</i>	<i>Lonicera</i> Linn.	<i>Lonicera japonica</i> Thunb.	Forest/Village /Terraces/Stream
209	<i>Caprifoliaceae</i>	<i>Lonicera</i> Linn.	<i>Lonicera hypoglauca</i> Miq.	Forest
210	<i>Caprifoliaceae</i>	<i>Lonicera</i> Linn.	<i>Lonicera rhytidophylla.</i>	Forest
211	<i>Caprifoliaceae</i>	<i>Viburnum</i> Linn.	<i>Viburnum sempervirens</i> K.	Forest
212	<i>Caprifoliaceae</i>	<i>Viburnum</i> Linn.	<i>Viburnum erosum</i> Thunb.	Forest



213	Caprifoliaceae	Viburnum Linn.	Viburnum luzonicum Rolfe.	Forest
214	Caprifoliaceae	Viburnum Linn.	Viburnum fordiae Hance.	Forest
215	Hamamelidaceae	Loropetalum	Loropetalum chinensis (R. Br.) Oliv.	Forest/Village /Stream
216	Hamamelidaceae	Loropetalum	Loropetalum chinense	Forest/Village /Stream
217	Hamamelidaceae	Altingia	Altingia chinensis	Forest
218	Hamamelidaceae	Distylium Sieb.	Distylium myricoides Hemsl.	Forest
219	Platanaceae	Platanus	Platanus acerifolia Willd.	Forest
220	Daphniphyllaceae	Daphniphyllum .	Daphniphyllum macropodum Miq.	Forest
221	Cucurbitaceae	Trichosanthes Linn.	Trichosanthes kirilowii Maxim.	Terraces/Village
222	Cucurbitaceae	Cucumis	Cucumis sativus Linn.	Terraces/Village
223	Cucurbitaceae	Citrullus	Citrullus lanatus	Terraces/Village
224	Cucurbitaceae	Cucumis	Cucumis melo L.	Terraces/Village
225	Cucurbitaceae	Luffa Mill.	Luffa cylindrical	Terraces/Village
226	Cucurbitaceae	Benincasa	Benincasa hispida Thunb.	Terraces/Village
227	Cucurbitaceae	Cucurbita Linn.	Cucurbita moschata	Terraces/Village
228	Cucurbitaceae	Lagenaria Ser.	Lagenaria siceraria	Terraces/Village
229	Cucurbitaceae	Sechium	Sechium edule	Terraces/Village
230	Begoniaceae	Begonia	Cut/leaved Begonia	Forest/Village
231	Begoniaceae	Begonia	Begonia fimbriatipula Hance.	Forest
232	Salicaceae	Salix L.	S.babylonica L.	Village /Stream
233	Brassicaceae	Brassica	Brassica pekinensis	Terraces/Village
234	Brassicaceae	Brassica	Brassica chinensis	Terraces/Village
235	Brassicaceae	Capsella	Capsella bursa/pastoris	Terraces/Village
236	Brassicaceae	Brassica	Brassica oleracea L.	Terraces/Village
237	Brassicaceae	Brassica	Brassica oleracea L.	Terraces/Village
238	Brassicaceae	Brassica	Brassica campestris L.	Terraces/Village
239	Brassicaceae	Raphanus	Raphanus sativus L	Terraces/Village
240	Brassicaceae	Lepidium L.	Lepidium apetalum	Forest/Terraces/Village /Stream
241	Brassicaceae	Rorippa	Rorippa indica	Forest/Terraces/Village /Stream
242	Brassicaceae	Rorippa	Rorippa indica	Forest/Terraces/Village /Stream
243	Myricaceae	Myrica L.	Myrica rubra (Lour.) S.	Forest/Village
244	Betulaceae	Betula.	Betula luminifera H.	Forest
245	Fagaceae	Cyclobalanopsis Oerst.	Cyclobalanopsis glauca(Thunb.) Oerst.	Forest
246	Fagaceae	Cyclobalanopsis Oerst.	Fagus longipetiolata.	Forest
247	Fagaceae	Cyclobalanopsis Oerst.	Cyclobalanopsis gracilis Rehd.	Forest
248	Fagaceae	Cyclobalanopsis Oerst.	Cyclobalanopsis chungii Metc.	Forest
249	Fagaceae	Cyclobalanopsis Oerst.	Cyclobalanopsis myrsinifolia (Blume) Oersted.	Forest
250	Fagaceae	Castanea	Castanea mollissima	Forest
251	Fagaceae	Castanea	Castanea henryi (Skam) Rehd.	Forest
252	Fagaceae	Castanopsis	Castanopsis carlesii(Hemsl.) Hay.	Forest
253	Fagaceae	Castanopsis	Castanopsis sclerophylla(Lindl.) Schott.	Forest
254	Fagaceae	Castanea	Castanea seguinii Dode.	Forest
255	Fagaceae	Castanopsis	Castanopsis faberi Hance.	Forest
256	Fagaceae	Castanopsis	Castanopsis fordii Hanc.	Forest
257	Fagaceae	Castanopsis	Castanopsis kawakamii Hay.	Forest
258	Fagaceae	Castanopsis	Castanopsis eyrei (Champ.) Tutch.	Forest
259	Fagaceae	Castanopsis	Castanopsis megaphylla Hu.	Forest
260	Fagaceae	Quercus	Lithocarpus uvarifolius (Hance) Rehd.	Forest
261	Fagaceae	Quercus	Lithocarpus amygdalifolius (Skan) Hayata.	Forest
262	Fagaceae	Quercus	Lithocarpus oleaefolius A.	Forest
263	Fagaceae	Quercus	Lithocarpus glaber (Thunb.) Nakai.	Forest
264	Fagaceae	Quercus	Lithocarpus harlandii Rehd.	Forest
265	Fagaceae	Quercus	Quercus acutissima Carruth.	Forest
266	Fagaceae	Quercus	Quercus chenii Nakai.	Forest
267	Fagaceae	Quercus	Quercus phillyraeoides A.Gary.	Forest
268	Chenopodiaceae	Spinacia L.	Spinacia oleracea L.	Terraces/Village
269	Chenopodiaceae	Kochia	Kochia scoparia.	Village /Stream
270	Amaranthaceae	Achyranthes L.	Achyranthes longifolia	Forest/Village /Stream
271	Amaranthaceae	Achyranthes L.	Achyranthes bidentata Blume.	Forest/Village /Stream
272	Amaranthaceae	Celosia L.	Celosia argentea L.	Terraces/Village /Stream
273	Amaranthaceae	Celosia L.	Celosia cristata L.	Village /Stream
274	Amaranthaceae	Portulaca L.	Portulaca oleracea L.	Forest/Terraces/Stream
275	Amaranthaceae	Amaranthus	Amaranthus retroflexus.	Forest
276	Amaranthaceae	Amaranthus	Amaranthus tricolor L.	Terraces

277	<i>Amaranthaceae</i>	<i>Amaranthus</i>	<i>Amaranthus spinosus</i>	Terraces/Village
278	<i>Amaranthaceae</i>	<i>Portulaca</i> L.	<i>Portulaca grandiflora</i>	Terraces/Village /Stream
279	<i>Amaranthaceae</i>	<i>Alternanthera</i> Forsk.	<i>Alternanthera Philoxeroides</i> (Mart.) Griseb.	Terraces/Village /Stream
280	<i>Caryophyllaceae</i>	<i>Endarachne</i> .	<i>Malachium aquaticum</i> L.	Forest/Village /Terraces/Stream
281	<i>Juglandaceae</i>	<i>Platycarya</i>	<i>Platycarya strobilacea</i> Sieb.	Forest
282	<i>Casuarinaceae</i>	<i>Casuarina</i>	<i>Casuarina glauca</i> Sieber.	Forest
283	<i>Ulmaceae</i>	<i>Ulmus</i> L.	<i>Ulmus parvifolia</i> Jacq.	Forest/Terraces
284	<i>Ulmaceae</i>	<i>Trema</i> Lour.	<i>Trema angustifolia</i> (Planch.) Bl.	Forest/Village
285	<i>Ulmaceae</i>	<i>Trema</i> Lour.	<i>Trema cannabina</i> Lour.	Forest
286	<i>Ulmaceae</i>	<i>Trema cannabina</i> Lour.	<i>Trema dielsiana</i> Hand.	Forest
287	<i>Ulmaceae</i>	<i>Celtis</i> L.	<i>Celtis julianae</i> Schneid.	Forest
288	<i>Moraceae</i>	<i>Morus</i> Linn.	<i>Morus alba</i> L.	Forest/Terraces/Village /Stream
289	<i>Moraceae</i>	<i>Morus</i> Linn.	<i>Morus australis</i> Poir.	Forest/Terraces/Village /Stream
290	<i>Moraceae</i>	<i>Broussonetia</i> L.	<i>Broussonetia papyrifera</i> Linn.	Forest/Terraces/Village /Stream
291	<i>Moraceae</i>	<i>Broussonetia</i> L.	<i>Broussonetia kaempferi</i> Sieb.	Forest
292	<i>Moraceae</i>	<i>Artocarpus</i> Forst .	<i>Artocarpus hypargyreus</i> Hance.	Forest
293	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus concinna</i> Miq.	Forest/Village
294	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus microcarpa</i> Linn.	Forest/Village /Stream
295	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus erecta</i> Thunb.	Forest
296	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus variolosa</i> Lindl.	Forest
297	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus heteromorpha</i> Hemsl.	Forest
298	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus hirta</i> Vahl.	Forest/Village /Stream
299	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus pumila</i> Linn.	Forest/Village /Stream
300	<i>Moraceae</i>	<i>Ficus</i> Linn.	<i>Ficus sarmentosa</i>	Forest
301	<i>Moraceae</i>	<i>Cudrania</i> Trec.	<i>Cudrania tricuspidata</i> Carr.	Forest/Village
302	<i>Urticaceae</i>	<i>Boehmeria</i>	<i>Boehmeria nivea</i> (L.) Gaudich.	Forest/Village /Terraces/Stream
303	<i>Urticaceae</i>	<i>Boehmeria</i>	<i>Boehmeria gracilis</i> C.	Forest/Village /Terraces/Stream
304	<i>Urticaceae</i>	<i>Oreocnide</i>	<i>Oreocnide frutescens</i> sp	Forest/Village /Terraces/Stream
305	<i>Urticaceae</i>	<i>Elatostema</i>	<i>Elatostema umbellatum</i>	Forest/Village /Terraces/Stream
306	<i>Urticaceae</i>	<i>Pouzolzia</i>	<i>Pouzolzia zeylanica</i>	Forest/Village /Terraces/Stream
307	<i>Urticaceae</i>	<i>Pilea</i> Lindl.	<i>Pilea pumila</i> .	Forest/Village /Terraces/Stream
308	<i>Urticaceae</i>	<i>Pilea</i> Lindl.	<i>Pilea sinofasciata</i>	Forest/Village /Terraces/Stream
309	<i>Eucommiaceae</i>	<i>Eucommia</i> Oliv	<i>E. ulmoides</i> Oliv.	Forest
310	<i>Capparaceae</i>	<i>Capparis</i>	<i>C.acutifolia</i> Sweet.	Forest
311	<i>Polygalaceae</i>	<i>Polygala</i> L.	<i>P.fallax</i> Hemsl.	Forest
312	<i>Polygalaceae</i>	<i>Polygala</i> L.	<i>Polygala fallax</i> Hemsl.	Forest
313	<i>Tiliaceae</i>	<i>Tilia</i> L.	<i>T.tuan</i> Szyszyl.	Forest/Village
314	<i>Elaeocarpaceae</i>	<i>Elaeocarpus</i>	<i>Elaeocarpus decipiens</i> Hemsl.	Forest
315	<i>Elaeocarpaceae</i>	<i>Sloanea</i> Linn.	<i>Sloanea sinensis</i>	Forest
316	<i>Commelinaceae</i>	<i>Pollia</i>	<i>Pollia japonica</i> Thunb.	Village
317	<i>Pontederiaceae</i> Kunth.	<i>Eichhornia</i>	<i>Eichhornia crassipes</i> .	Terraces/Village /Stream
318	<i>Pontederiaceae</i> Kunth.	<i>Monochoria</i>	<i>Monochoria korsakowii</i>	Terraces/Village /Stream
319	<i>Sterculiaceae</i>	<i>Reevesia</i>	<i>Reevesia pycnantha</i> Linn.	Forest
320	<i>Malvaceae</i>	<i>Hibiscus</i> Zhu.	<i>Hibiscus syriacus</i> Linn.	Village /Stream
321	<i>Malvaceae</i>	<i>Urena</i> Linn.	<i>Urena procumbens</i> Linn.	Forest
322	<i>Malvaceae</i>	<i>Urena</i> Linn.	<i>Urena lobata</i> Linn.	Forest
323	<i>Euphorbiaceae</i>	<i>Glochidion</i> T.	<i>Glochidion puberum</i> L.	Forest/Village
324	<i>Euphorbiaceae</i>	<i>Vernicia</i> Lour.	<i>Vernicia fordii</i> (Hemsl.) Airy Shaw.	Forest/Village
325	<i>Euphorbiaceae</i>	<i>Mallotus</i> Lour.	<i>Mallotus lianus</i> Croiz.	Forest
326	<i>Euphorbiaceae</i>	<i>Euphorbia</i> L.	<i>B. japonicas</i> (Thunb) Muell/Arg. var. floccosus Hwang.	Forest
327	<i>Euphorbiaceae</i>	<i>Euphorbia</i> L.	<i>Euphorbia hirta</i>	Terraces/Village /Stream
328	<i>Euphorbiaceae</i>	<i>Mallotus</i> Lour.	<i>Mallotus repandus</i> (Willd.) Muell.	Forest
329	<i>Euphorbiaceae</i>	<i>Sapium</i>	<i>Sapium sebiferum</i> (L.) Roxb.	Forest/Village /Terraces/Stream
330	<i>Euphorbiaceae</i>	<i>Sapium</i>	<i>Sapium atrobadiomaculatum</i> Metc.	Forest/Village /Terraces/Stream
331	<i>Euphorbiaceae</i>	<i>Mallotus</i> Lour.	<i>Mallotus philippensis</i>	Forest
332	<i>Euphorbiaceae</i>	<i>Bischofia</i>	<i>Bischofia polycarpa</i>	Forest
333	<i>Euphorbiaceae</i>	<i>Breynia</i>	<i>Breynia fruticosa</i>	Forest
334	<i>Euphorbiaceae</i>	<i>Euphorbia</i> L.	<i>Euphorbia pulcherrima</i> Willd.	Village /Stream
335	<i>Euphorbiaceae</i>	<i>Acalypha</i> L.	<i>Acalypha minima</i> H. Keng.	Terraces/Village /Stream
336	<i>Theaceae</i>	<i>Camellia</i> L.	<i>C.octopetala</i> Hu.	Forest
337	<i>Theaceae</i>	<i>Camellia</i> L.	<i>Camlligrijsii</i> Hamce.	Forest
338	<i>Theaceae</i>	<i>Camellia</i> L.	<i>Camellia edithae</i> Hance.	Forest
339	<i>Theaceae</i>	<i>Camellia</i> L.	<i>Camellia japonica</i> L.	Forest/Terraces/Village

340	<i>Theaceae</i>	<i>Tutcheria</i>	<i>Tutcheria symplocifolia</i> Merr.	Forest
341	<i>Theaceae</i>	<i>Adinandra</i>	<i>Adinandra millettii</i> Hook.	Forest
342	<i>Actinidiaceae</i>	<i>Actinidia</i>	<i>Actinidia lanceolata</i> Dunn.	Forest
343	<i>Actinidiaceae</i>	<i>Actinidia</i>	<i>Actinidia hemsleyana</i> .	Forest
344	<i>Ericaceae</i>	<i>Rhododendron</i> L.	<i>Rhododendron championiae</i> Hook.	Forest/Village /Stream
345	<i>Ericaceae</i>	<i>Rhododendron</i> L.	<i>Rhododendron latoucheae</i> Franch.	Forest
346	<i>Ericaceae</i>	<i>Rhododendron</i> L.	<i>Rhododendron mariesii</i> Hemsl.	Forest/Village /Stream
347	<i>Ericaceae</i>	<i>Rhododendron</i> L.	<i>Rhododendron seniavinii</i> Maxim.	Forest
348	<i>Ericaceae</i>	<i>Lyonia</i> Nutt.	<i>Lyonia ovalifolia</i>	Forest/Terraces
349	<i>Primulaceae</i>	<i>Lysimachia</i>	<i>Lysimachia christinae</i> Hance.	Forest/Terraces
350	<i>Primulaceae</i>	<i>Lysimachia</i>	<i>Lysimachia fukienensis</i>	Forest/Terraces
351	<i>Vacciniaceae</i>	<i>Vaccinium</i>	<i>Vaccinium carlesii</i> Dunn.	Forest
352	<i>Vacciniaceae</i>	<i>Vaccinium</i>	<i>Vaccinium trichocladum</i> Merr.	Forest
353	<i>Myrtaceae</i>	<i>Melaleuca</i> L.	<i>Melaleuca leucadendron</i> L.	Village /Stream
354	<i>Myrtaceae</i>	<i>Rhodomyrtus</i>	<i>Rhodomyrtus tomentosa</i>	Forest
355	<i>Myrtaceae</i>	<i>Syzygium</i>	<i>Syzygium buxifolium</i> Hook.	Forest
356	<i>Myrtaceae</i>	<i>Syzygium</i>	<i>Syzygium austrosinense</i> Chang.	Forest
357	<i>Myrtaceae</i>	<i>Psidium</i> Linn.	<i>Psidium guajava</i> Linn.	Forest
358	<i>Trapaceae</i>	<i>Trapa</i> L.	<i>Trapa bicornis</i>	Stream
359	<i>Melastomataceae</i>	<i>Melastoma</i> L.	<i>Melastoma dodecandrum</i> Lour.	Forest
360	<i>Melastomataceae</i>	<i>Melastoma</i> L.	<i>Melastoma intermedium</i> Dunn.	Forest
361	<i>Melastomataceae</i>	<i>Bredia</i>	<i>Bredia sinensis</i>	Forest
362	<i>Melastomataceae</i>	<i>Phyllagathis</i> Bl.	<i>Phyllagathis fordii</i> Hance.	Forest
363	<i>Melastomataceae</i>	<i>Blastus</i> Lour.	<i>Blastus apricus</i> Hand.	Forest/Village
364	<i>Melastomataceae</i>	<i>Blastus</i> Lour.	<i>Blastus cochinchinensis</i> Lour.	Forest/Village
365	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex chinensis</i> Sims.	Forest
366	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex kwangtungensis</i> Merr.	Forest
367	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex pedunculosa</i> Miq.	Forest
368	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex formosana</i>	Forest
369	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex elmerrilliana</i> S.	Forest
370	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex ficoidea</i> Hemsl.	Forest
371	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	Chinese holly	Forest
372	<i>Aquifoliaceae</i>	<i>Ilex</i> L.	<i>Ilex hylonoma</i> Hu.	Forest
373	<i>Celastraceae</i>	<i>Euonymus</i>	<i>Euonymus hederaceus</i> Champ.	Forest
374	<i>Celastraceae</i>	<i>Celastrus</i> L.	<i>Celastrus gemmatus</i> Loes.	Forest
375	<i>Celastraceae</i>	<i>Celastrus</i> L.	<i>Celastrus oblanceifolius</i> Wang.	Forest
376	<i>Celastraceae</i>	<i>Celastrus</i> L.	<i>Celastrus paniculatus</i> Willd.	Forest
377	<i>Rhamnaceae</i>	<i>Rhamnus</i> L.	<i>Rhamnus crenata</i> Sieb.	Forest/Terraces/Village /Stream
378	<i>Rhamnaceae</i>	<i>Rhamnus</i> L.	<i>Rhamnus napalensis</i> Wall.	Forest/Village
379	<i>Rhamnaceae</i>	<i>Hovenia</i> Thunb.	<i>Hovenia acerba</i> Lindl.	Forest
380	<i>Vitaceae</i>	<i>Vitis</i> L.	<i>Vitis chungii</i> Metc.	Forest/Village
381	<i>Vitaceae</i>	<i>Vitis</i> L.	<i>Vitis heyneana</i> Roem.	Forest/Village
382	<i>Vitaceae</i>	<i>Vitis</i> L.	<i>Vitis angustifolia</i> Benth.	Village
383	<i>Vitaceae</i>	<i>Vitis</i> L.	<i>Vitis vinifera</i> .	Village
384	<i>Vitaceae</i>	<i>Parthenocissus</i> Planch.	<i>Parthenocissus heterophylla</i> (Bl.) Merr.	Forest/Village /Stream
385	<i>Vitaceae</i>	<i>Parthenocissus</i> Planch.	<i>Parthenocissus laetevirens</i> Rehd.	Village /Stream
386	<i>Vitaceae</i>	<i>Ampelopsis</i> Michx.	<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.	Forest
387	<i>Vitaceae</i>	<i>Ampelopsis</i> Michx.	<i>Ampelopsis delavayana</i> (Franch.) Planch.	Forest
388	<i>Myrsinaceae</i>	<i>Ardisia</i>	<i>Ardisia japonica</i> (Thunb) Blume.	Forest
389	<i>Myrsinaceae</i>	<i>Ardisia</i>	<i>Ardisia quinqueгона</i> Bl.	Forest
390	<i>Myrsinaceae</i>	<i>Maesa</i> Forsk.	<i>Maesa montana</i> A.	Forest
391	<i>Ebenaceae</i>	<i>Diospyros</i> Linn.	<i>Diospyros cathayensis</i> Steward.	Forest/Village
392	<i>Ebenaceae</i>	<i>Diospyros</i> Linn.	<i>Diospyros rhombifolia</i> Hemsl.	Forest/Village
393	<i>Ebenaceae</i>	<i>Diospyros</i> Linn.	<i>Diospyros morrisiana</i> Hance.	Forest/Village
394	<i>Ebenaceae</i>	<i>Diospyros</i> Linn.	<i>Diospyros kakisilvestris</i>	Forest/Village
395	<i>Rutaceae</i>	<i>Citrus</i> L.	<i>C. medica</i> L.	Forest
396	<i>Rutaceae</i>	<i>Randia</i>	<i>Clausena excavate</i> Burm.	Forest/Village
397	<i>Rutaceae</i>	<i>Evodia</i> J.	<i>Evodia leptota</i> Spreng.	Forest
398	<i>Rutaceae</i>	<i>Toddalia</i> A. Juss.	<i>Toddalia asiatica</i> (L.) Lam.	Forest
399	<i>Rutaceae</i>	<i>Zanthoxylum</i>	<i>Zanthoxylum armatum</i>	Forest
400	<i>Rutaceae</i>	<i>Zanthoxylum</i> L.	<i>Zanthoxylum nitidum</i> Roxb.	Forest
401	<i>Rutaceae</i>	<i>Zanthoxylum</i> L.	<i>Z. simulans</i> Hance.	Forest
402	<i>Rutaceae</i>	<i>Citrus</i> L.	<i>Citrus sinensis</i> Osbeck.	Village /Terraces
403	<i>Rutaceae</i>	<i>Citrus</i> L.	<i>Citrus reticulata</i>	Village /Terraces
404	<i>Rutaceae</i>	<i>Citrus</i> L.	<i>Citrus maxima</i>	Village

405	<i>Umbelliferae</i>	<i>Daucus</i> L.	<i>Daucus carota</i>	Terraces/Village
406	<i>Umbelliferae</i>	<i>Chaerophyllum</i> L.	<i>Apium graveolens</i> Linn.	Terraces/Village
407	<i>Umbelliferae</i>	<i>Coriandrum</i> L.	<i>Coriandrum sativum</i> L.	Terraces/Village
408	<i>Umbelliferae</i>	<i>Angelica</i> L.	<i>Angelica pubescens</i> Maxim.	Forest
409	<i>Umbelliferae</i>	<i>Torilis</i> Adans.	<i>Torilis scabra</i>	Terraces/Village /Stream
410	<i>Burseraceae</i>	<i>Canarium</i>	<i>Canarium album</i>	Village /Stream
411	<i>Oxalidaceae</i>	<i>Oxalis</i>	<i>Oxalis corniculata</i> L.	Terraces/Village /Stream
412	<i>Meliaceae</i>	<i>Melia</i> Linn.	<i>Melia azedarach</i> Linn.	Forest/Terraces/Village /Stream
413	<i>Sapindaceae</i>	<i>Dimocarpus</i>	<i>Helicia formosana</i>	Village
414	<i>Sapindaceae</i>	<i>Litchi</i>	<i>Litchi chinensis</i> Sonn.	Village
415	<i>Sapindaceae</i>	<i>Meliosma</i> spp.	<i>Meliosma rhoifolia</i> Maxim.	Forest
416	<i>Sapindaceae</i>	<i>Meliosma</i> spp.	<i>Meliosma rigida</i>	Forest
417	<i>Anacardiaceae</i>	<i>Mangifera</i> L.	<i>Mangifera indica</i> L.	Village /Stream
418	<i>Aceraceae</i>	<i>Acer</i> Linn.	<i>Acer palmatum</i> Thunb.	Forest/Terraces/Village /Stream
419	<i>Aceraceae</i>	<i>Acer</i> Linn.	<i>Acer confertifolium</i> Merr.	Forest
420	<i>Aceraceae</i>	<i>Acer</i> Linn.	<i>Acer oliverianum</i>	Village
421	<i>Aceraceae</i>	<i>Acer</i> Linn.	<i>Acer cordatum</i> Pax.	Forest
422	<i>Aceraceae</i>	<i>Toxicodendron</i>	<i>Toxicodendron sylvestri</i> Sieb.	Village
423	<i>Aceraceae</i>	<i>Spondias</i> L.	<i>Spondias lakonensis</i> Pierre.	Forest
424	<i>Staphyleaceae</i>	<i>Euscaphis</i> Sieb.	<i>Euscaphis japonica</i>	Forest
425	<i>Buddlejaceae</i>	<i>Buddleja</i> Linn.	<i>Buddleja lindleyana</i> .	Forest/Stream
426	<i>Oleaceae</i>	<i>Laurus</i> L.	<i>Laurus nobilis</i>	Village /Stream
427	<i>Oleaceae</i>	<i>Jasminum</i> Linn.	<i>Jasminum yunnanense</i> Jien.	Village /Stream
428	<i>Oleaceae</i>	<i>Ligustrum</i> Linn.	<i>Ligustrum lucidum</i>	Village /Stream
429	<i>Oleaceae</i>	<i>Ligustrum</i> Linn.	<i>Ligustrum sinense</i> Lour.	Stream
430	<i>Oleaceae</i>	<i>Jasminum</i> Linn.	<i>Jasminum sambac</i> (L.) Ait.	Forest/Village /Stream
431	<i>Apocynaceae</i>	<i>Ecdysanthera</i>	<i>Ecdysanthera rosea</i>	Forest
432	<i>Apocynaceae</i>	<i>Trachelospermum</i> Lem.	<i>Trachelospermum axillare</i>	Forest/Village /Stream
433	<i>Apocynaceae</i>	<i>Trachelospermum</i> Lem.	<i>Trachelospermum jasminoides</i>	Forest/Village /Stream
434	<i>Apocynaceae</i>	<i>Trachelospermum</i> Lem.	<i>Trachelospermum gracilipes</i> Hook.f.	Forest/Village /Stream
435	<i>Apocynaceae</i>	<i>Nerium</i>	<i>Nerium indicum</i>	Forest/Village /Stream
436	<i>Asclepiadaceae</i>	<i>Cynanchum</i> Linn.	<i>Cynanchum glaucescens</i>	Forest
437	<i>Verbenaceae</i>	<i>Vitex</i> .	<i>Vitex negundo</i> Linn.	Forest
438	<i>Rubiaceae</i>	<i>Galium</i> Linn.	<i>Galium aparine</i> Linn.	Terraces/Stream
439	<i>Rubiaceae</i>	<i>Adina</i> Salisb.	<i>Adina pilulifera</i>	Terraces/Village /Stream
440	<i>Rubiaceae</i>	<i>Uncaria</i> Schreber.	<i>Uncaria tomentosa</i>	Forest
441	<i>Rubiaceae</i>	<i>Mussaenda</i> Linn.	<i>Mussaenda esquirolli</i> Levl.	Forest
442	<i>Rubiaceae</i>	<i>Psychotria</i> Linn.	<i>Psychotria rubra</i>	Forest
443	<i>Rubiaceae</i>	<i>Lasianthus</i>	<i>Lasianthus wallichii</i>	Forest
444	<i>Rubiaceae</i>	<i>Paederia</i> Linn.	<i>Paederia scandens</i>	Forest/Village
445	<i>Rubiaceae</i>	<i>Hedyotis</i> Linn.	<i>Hedyotis chrysotricha</i>	Forest
446	<i>Verbenaceae</i>	<i>Vitex</i> .	<i>Vitex negundo</i> Linn.	Forest
447	<i>Verbenaceae</i>	<i>Lantana montevidensis</i> Briq.	<i>Lantana camara</i> L.	Village /Stream
448	<i>Verbenaceae</i>	<i>Callicarpa</i> L.	<i>Callicarpa bodinieri</i> Levl.	Forest
449	<i>Verbenaceae</i>	<i>Callicarpa</i> L.	<i>Callicarpa longissima</i>	Forest/Terraces/Village /Stream
450	<i>Verbenaceae</i>	<i>Premna</i>	<i>Premna microphylla</i>	Forest
451	<i>Verbenaceae</i>	<i>Vitex</i>	<i>Vitex quinata</i>	Forest
452	<i>Verbenaceae</i>	<i>Clerodendrum</i>	<i>Clerodendrum canescens</i>	Forest
453	<i>Verbenaceae</i>	<i>Clerodendrum</i>	<i>Clerodendrum bungei</i>	Forest
454	<i>Verbenaceae</i>	<i>Clerodendrum</i>	<i>Clerodendrum cyrtophyllum</i> Turcz.	Forest
455	<i>Verbenaceae</i>	<i>Clerodendrum</i>	<i>Clerodendrum japonicum</i>	Forest
456	<i>Ranunculaceae</i>	<i>Clematis</i> L.	<i>Clematis uncinata</i>	Terraces/Stream
457	<i>Ranunculaceae</i>	<i>Clematis</i> L.	<i>Clematis armandii</i>	Terraces/Village
458	<i>Ranunculaceae</i>	<i>Coptis</i> Salisb.	<i>Coptis chinensis</i> Franch.	Forest
459	<i>Ranunculaceae</i>	<i>Clematis</i> L.	<i>Clematis chinensis</i>	Forest
460	<i>Ranunculaceae</i>	<i>Ranunculus</i> L.	<i>Ranunculus japonicus</i> Thunb.	Terraces/Stream
461	<i>Ranunculaceae</i>	<i>Ranunculus</i> L.	<i>Ranunculus sceleratus</i> L.	Terraces/Village /Stream
462	<i>Ranunculaceae</i>	<i>Paeonia</i>	<i>P.suffruticosa</i> Andr	Terraces/Stream
463	<i>Nelumbonaceae</i>	<i>Nelumbo</i>	<i>Nelumbo nucifera</i> G.	
464	<i>Saururaceae</i>	<i>Houttuynia</i> Thunb.	<i>Houttuynia cordata</i> .	Forest/Village /Terraces/Stream
465	<i>Lardizabalaceae</i>	<i>Akebia</i> Decne.	<i>Akebia quinata</i>	Forest
466	<i>Lardizabalaceae</i>	<i>Akebia</i> Decne.	<i>Akebia quinata</i> (Houtt.) Decne.	Forest
467	<i>Menispermaceae</i>	<i>Cocculus</i>	<i>Cocculus orbiculatus</i>	Forest
468	<i>Menispermaceae</i>	<i>Stephania</i>	<i>Stephania cepharantha</i>	Terraces/Village /Stream
469	<i>Menispermaceae</i>	<i>Stephania</i>	<i>Stephania tetrandra</i>	Terraces/Village /Stream
470	<i>Berberidaceae</i>	<i>Mahonia</i> Nuttall.	<i>Mahonia fortunei</i>	Forest
471	<i>Berberidaceae</i>	<i>Epimedium</i> Linn.	<i>Epimedium brevicornu</i> Maxim.	Forest
472	<i>Polygonaceae</i>	<i>Polygonum</i> L.	<i>Polygonum hydropiper</i>	Terraces/Stream

473	<i>Polygonaceae</i>	<i>Polygonum</i> L.	<i>Polygonum maackianum</i> Regel.	Terraces/Stream
474	<i>Polygonaceae</i>	<i>Polygonum</i> L.	<i>Polygonum chinensis</i>	Terraces/Stream
475	<i>Polygonaceae</i>	<i>Reynoutria</i> Houtt.	<i>Reynoutria japonica</i> Houtt.	Forest/Terraces/Village
476	<i>Polygonaceae</i>	<i>Fallopia</i> Adans.	<i>Fallopia multiflora</i>	Terraces/Stream
477	<i>Polygonaceae</i>	<i>Polygonum</i> L.	<i>Polygonum perfoliatum</i> L.	Terraces/Village /Stream
478	<i>Lythraceae</i>	<i>Lagerstroemia</i> L.	<i>Lagerstroemia limii</i> Merr.	Forest
479	<i>Lythraceae</i>	<i>Lagerstroemia</i> L.	<i>Lagerstroemia speciosa</i> Pers.	Village /Stream
480	<i>Lythraceae</i>	<i>Cuphea</i> P.	<i>Cuphea hyssopifolia</i>	Forest
481	<i>Lythraceae</i>	<i>Lagerstroemia</i> L.	<i>Lagerstroemia indica</i> L.	Forest/Village /Stream
482	<i>Lythraceae</i>	<i>Rotala</i> Linn.	<i>Rotala indices</i>	Terraces/Village /Stream
483	<i>Asteraceae</i>	<i>Bidens</i>	<i>Bidens pilosa</i> L.	Terraces/Village /Stream
484	<i>Asteraceae</i>	<i>Senecio</i> L.	<i>Senecio scandens</i> Buch.	Forest/Terraces/Village /Stream
485	<i>Asteraceae</i>	<i>Artemisia</i> Linn.	<i>Artemisia argyi</i> H.	Forest/Terraces/Village /Stream
486	<i>Asteraceae</i>	<i>Xanthium</i> L.	<i>Xanthium sibiricum</i>	Forest/Village /Stream
487	<i>Asteraceae</i>	<i>Lactuca</i> L.	<i>Lactuca sativa</i>	Terraces/Village
488	<i>Asteraceae</i>	<i>Lactuca</i> L.	<i>Lactuca sativa</i> L.	Terraces/Village
489	<i>Asteraceae</i>	<i>Sonchus</i>	<i>Sonchus brachyotus</i>	Terraces/Village
490	<i>Asteraceae</i>	<i>Zinnia</i>	<i>Zinnia elegans</i> Jacq.	Village /Stream
491	<i>Asteraceae</i>	<i>Helianthus</i>	<i>Helianthus annuus</i>	Village /Stream
492	<i>Asteraceae</i>	<i>Youngia</i>	<i>Youngia japonica</i>	Forest/Terraces/Village /Stream
493	<i>Asteraceae</i>	<i>Emilia</i> Cass.	<i>Emilia sonchifolia</i>	Forest/Terraces/Village /Stream
494	<i>Asteraceae</i>	<i>Taraxacum</i> F.	<i>Taraxacum mongolicum</i> Hand.	Forest/Terraces/Village /Stream
495	<i>Asteraceae</i>	<i>Crassocephalum</i>	<i>Crassocephalum crepidioides</i>	Terraces/Village /Stream
496	<i>Asteraceae</i>	<i>Erigeron</i>	<i>Erigeron annuus</i>	Terraces/Village /Stream
497	<i>Asteraceae</i>	<i>Conyza</i>	<i>Conyza canadensis</i>	Terraces/Village /Stream
498	<i>Asteraceae</i>	<i>Hemistepta</i>	<i>Hemistepta lyrata</i>	Village /Stream
499	<i>Asteraceae</i>	<i>Eupatorium</i>	<i>Chromolaena odorata</i>	Terraces/Village /Stream
500	<i>Asteraceae</i>	<i>Gnaphalium</i>	<i>Gnaphalium affine</i> D. Don.	Terraces/Village /Stream
501	<i>Solanaceae</i>	<i>Solanum</i> L.	<i>Solanum melongena</i>	Terraces/Village
502	<i>Solanaceae</i>	<i>Lycianthes</i>	<i>Lycianthes biflora</i>	Forest/Terraces/Village /Stream
503	<i>Solanaceae</i>	<i>Datura</i> Linn.	<i>Datura stramonium</i> Linn.	Forest/Village
504	<i>Solanaceae</i>	<i>Capsicum</i> L.	<i>Capsicum annuum</i> L.	Village /Terraces
505	<i>Solanaceae</i>	<i>Solanum</i> L.	<i>Solanum tuberosum</i>	Village /Terraces
506	<i>Solanaceae</i>	<i>Capsicum</i> L.	<i>Capsicum frutescens</i> L.	Village /Terraces
507	<i>Solanaceae</i>	<i>Solanum</i> L.	<i>Lycopersicon esculentum</i> Mill.	Village /Terraces
508	<i>Solanaceae</i>	<i>Petunia</i> Juss.	<i>Petunia hybrida</i> Vilm.	Forest/Village /Terraces/Stream
509	<i>Solanaceae</i>	<i>Solanum</i> L.	<i>Solanum nigrum</i> L.	Forest/Village /Terraces/Stream
510	<i>Solanaceae</i>	<i>Solanum</i> L.	<i>Solanum americanum</i>	Forest/Village /Terraces/Stream
511	<i>Solanaceae</i>	<i>Atropa</i> L.	<i>Atropa belladonna</i> L.	Forest
512	<i>Convolvulaceae</i>	<i>Cuscuta</i>	<i>Cuscuta chinensis</i>	Forest
513	<i>Convolvulaceae</i>	<i>Ipomoea</i> Linn.	<i>Dioscorea esculenta</i>	Village /Terraces
514	<i>Convolvulaceae</i>	<i>Ipomoea</i> Linn.	<i>Ipomoea aquatic</i> Forsk.	Village /Terraces
515	<i>Convolvulaceae</i>	<i>Pharbitis</i> Choisy.	<i>Pharbitis nil</i> (L.) Choisy.	Forest/Village /Terraces/Stream
516	<i>Convolvulaceae</i>	<i>Calystegia</i>	<i>Calystegia hederacea</i>	Terraces/Village
517	<i>Convolvulaceae</i>	<i>Convolvulus</i>	<i>Convolvulus arvensis</i> L.	Terraces
518	<i>Convolvulaceae</i>	<i>Calystegia</i>	<i>Calystegia sepium</i>	Terraces
519	<i>Convolvulaceae</i>	<i>Ipomoea</i> Linn.	<i>Ipomoea quamoclit</i>	Terraces/Village /Stream
520	<i>Convolvulaceae</i>	<i>Ipomoea</i> Linn.	<i>Ipomoea fistulosa</i> Mart.	Forest/Village
521	<i>Lamiaceae</i>	<i>Clinopodium</i>	<i>Clinopodium chinense</i> B.	Terraces/Village /Stream
522	<i>Lamiaceae</i>	<i>Prunella</i>	<i>Prunella vulgaris</i> L.	Forest
523	<i>Lamiaceae</i>	<i>Mentha</i>	<i>Mentha haplocalyx</i> Briq.	Terraces/Village /Stream
524	<i>Lamiaceae</i>	<i>Agastache</i> C.	<i>Agastache rugosa</i> F.	Terraces/Village /Stream
525	<i>Lamiaceae</i>	<i>Leonurus</i> Linn.	<i>Leonurus artemisia</i> L.	Forest/Terraces/Village /Stream
526	<i>Lamiaceae</i>	<i>Perilla</i> L.	<i>Perilla frutescens</i> L.	Forest/Terraces/Village /Stream
527	<i>Lamiaceae</i>	<i>Ajuga</i>	<i>Ajuga reptans</i>	Forest/Terraces/Village /Stream
528	<i>Lamiaceae</i>	<i>Lamium</i>	<i>Lamium amplexicaule</i> L.	Terraces/Village
529	<i>Lamiaceae</i>	<i>Glechoma</i> Linn.	<i>Glechoma longituba</i>	Forest
530	<i>Lamiaceae</i>	<i>Scutellaria</i>	<i>Scutellaria indica</i> Linn.	Terraces/Village /Stream
531	<i>Lamiaceae</i>	<i>Rabdosia</i>	<i>Rabdosia serra</i>	Terraces/Village /Stream
532	<i>Lamiaceae</i>	<i>Salvia</i> Linn.	<i>Salvia splendens</i>	Village /Stream
533	<i>Boraginaceae</i>	<i>Cordia</i> L.	<i>Cordia dichotoma</i>	Forest/Village
534	<i>Boraginaceae</i>	<i>Carmona</i>	<i>Carmona microphylla</i>	Forest
535	<i>Plantaginaceae</i>	<i>Plantago</i> L.	<i>Plantago asiatica</i>	Forest/Terraces/Village /Stream
536	<i>Scrophulariaceae</i>	<i>Mazus miguelii</i> .	<i>Mazus japonicus</i> T.	Village /Terraces/Stream
537	<i>Scrophulariaceae</i>	<i>Paulownia</i> Sieb.	<i>Paulownia fortunei</i>	Village
538	<i>Scrophulariaceae</i>	<i>Paulownia</i> Sieb.	<i>Paulownia kawakamii</i>	Village
539	<i>Scrophulariaceae</i>	<i>Paulownia</i> Sieb.	<i>Paulownia kawakamii</i>	Village
540	<i>Acanthaceae</i>	<i>Peristrophe</i>	<i>Peristrophe japonica</i> Thunb.	Forest/Village Terraces/Stream



541	<i>Acanthaceae</i>	<i>Gendarussa</i>	<i>Grendarussa valgaris</i>	Forest/Village /Terraces/Stream
542	<i>Acanthaceae</i>	<i>Andrographis</i>	<i>Andrographis paniculata</i> Burn.	Forest/Village /Terraces/Stream
543	<i>Acanthaceae</i>	<i>Peristrophe</i>	<i>Peristrophe baphica</i>	Terraces/Village
544	<i>Musaceae</i>	<i>Musa</i>	<i>Musa balbisiana</i> Colla.	Forest/Village
545	<i>Musaceae</i>	<i>Musa</i>	<i>Musa nana</i> Lour.	Forest/Village
546	<i>Cannaceae</i>	<i>Canna</i> L.	<i>Canna indica</i> L.	Village
547	<i>Alismataceae</i>	<i>Alisma</i> Linn.	<i>Alisma plantago/aquatica</i>	Terraces/Stream
548	<i>Alismataceae</i>	<i>Sagittaria</i> L.	<i>Sagittaria sagittifolia</i>	Terraces/Stream
549	<i>Alismataceae</i>	<i>Sagittaria</i> L.	<i>Sagittaria trifolia</i>	Terraces/Stream
550	<i>Alismataceae</i>	<i>Heleocharis</i>	<i>Eleocharis dulcis</i>	Terraces
551	<i>Palmae</i>	<i>Livistona</i> R.	<i>Livistona chinensis</i>	Village /Stream
552	<i>Palmae</i>	<i>Rhapis</i> Linn.	<i>Rhapis excelsa</i>	Village /Stream
553	<i>Palmae</i>	<i>Washingtonia</i>	<i>Washingtonia filifera</i>	Village /Stream
554	<i>Araceae</i>	<i>Amorphophallus</i>	<i>Amorphophallus konjac</i>	Forest
555	<i>Araceae</i>	<i>Arisaema</i> Mart.	<i>Pinellia pedatisecta</i> Schott.	Forest
556	<i>Araceae</i>	<i>Arisaema</i> Mart.	<i>Arisaema erubescens</i> W.	Forest
557	<i>Araceae</i>	<i>Alocasia</i>	<i>Alocasia macrorrhiza</i>	Stream
558	<i>Araceae</i>	<i>Pinellia</i> Ten.	<i>Pinellia ternate</i>	Forest
559	<i>Araceae</i>	<i>Colocasia</i>	<i>Colocasia esculenta</i> L.	Village /Terraces
560	<i>Lemnaceae</i>	<i>Lemna</i> L.	<i>Lemna minor</i> L.	Terraces/Stream
561	<i>Dioscoreaceae</i>	<i>Dioscorea</i>	<i>Dioscorea opposita</i>	Forest
562	<i>Pink</i>	<i>Marsilea</i> L.	<i>Marsilea quadrifolia</i> L.	Terraces/Stream
563	<i>Cyperaceae</i>	<i>Kyllinga</i> Rottb.	<i>Kyllinga monocephala</i> Rottb.	Terraces/Stream
564	<i>Cyperaceae</i>	<i>Cyperus</i> Linn.	<i>Cyperus difformis</i> L.	Terraces/Village /Stream
565	<i>Cyperaceae</i>	<i>Cyperus</i> Linn.	<i>Cyperus iria</i>	Terraces/Village /Stream
566	<i>Cyperaceae</i>	<i>Juncellus</i> Griseb.	<i>Juncellus serotinus</i>	Terraces/Village /Stream
567	<i>Cyperaceae</i>	<i>Kyllinga</i> Rottb.	<i>Kyllinga brevifolia</i> Rottb.	Terraces/Village /Stream
568	<i>Cyperaceae</i>	<i>Pycnus</i>	<i>Pycnus polystachyus</i> Rottb.	Terraces/Village /Stream
569	<i>Cyperaceae</i>	<i>Scirpus</i> Linn.	<i>Scirpus validus</i> Vahl.	Terraces/Stream
570	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa lapidea</i>	Forest/Village
571	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa ventricosa</i>	Forest
572	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa rigida</i>	Forest
573	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa vulgaris</i>	Forest
574	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa pervariabilis</i>	Forest
575	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa longispiculata</i>	Forest
576	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa multiplex</i>	Forest/Village
577	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa multiplex</i>	Forest
578	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa multiplex</i>	Forest
579	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa pachinensis</i> .	Forest
580	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa remotiflora</i>	Forest
581	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa surrecta</i>	Forest
582	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa cerosissima</i>	Forest
583	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa chungii</i>	Forest
584	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa textilis</i>	Forest
585	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa textilis</i>	Forest
586	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa guangxiensis</i>	Forest
587	<i>Gramineae</i>	<i>Bambusa</i> Retz.	<i>Bambusa papillata</i>	Forest
588	<i>Gramineae</i>	<i>Thyrsostachys</i> Gamble.	<i>Thyrsostachys siamensis</i>	Forest
589	<i>Gramineae</i>	<i>Dendrocalamopsis</i> .	<i>Dendrocalamopsis oldhami</i>	Forest/Village
590	<i>Gramineae</i>	<i>Dendrocalamopsis</i> .	<i>Dendrocalamopsis basihirsuta</i>	Forest
591	<i>Gramineae</i>	<i>Dendrocalamopsis</i> .	<i>Dendrocalamopsis beecheyana</i>	Forest
592	<i>Gramineae</i>	<i>Dendrocalamopsis</i> .	<i>Dendrocalamus latiflorus</i>	Forest
593	<i>Gramineae</i>	<i>Dendrocalamopsis</i> .	<i>D. minor</i>	Forest
594	<i>Gramineae</i>	<i>Indocalamus</i> Nakai.	<i>Indocalamus tessellatus</i>	Forest
595	<i>Gramineae</i>	<i>Indocalamus</i> Nakai.	<i>Indocalamus decorus</i>	Forest
596	<i>Gramineae</i>	<i>Indocalamus</i> Nakai.	<i>Indocalamus latifolius</i>	Forest
597	<i>Gramineae</i>	<i>Indocalamus</i> Nakai.	<i>I. victorialis</i>	Forest/Stream
598	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys viridis</i>	Forest/Village
599	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys makinoi</i>	Forest
600	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys aurea</i>	Forest
601	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys meyeri</i>	Forest
602	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys nuda</i>	Forest
603	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys glauca</i>	Forest
604	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys iridescens</i>	Forest
605	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys vivax</i>	Forest
606	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys heterocykla</i>	Forest
607	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys heterocykla</i>	Forest/Village /Stream
608	<i>Gramineae</i>	<i>Phyllostachys</i>	<i>Phyllostachys heterocykla</i>	Forest/Village /Stream

609	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys kwangsiensis</i>	Forest
610	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys makinoi</i>	Forest
611	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys incarnate</i>	Forest
612	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys platyglossa</i>	Forest
613	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys bambusoides</i>	Forest
614	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys viridiglaucescens</i>	Forest
615	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys aureosulcata</i>	Forest
616	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys varioauriculata</i>	Forest
617	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys nigra</i>	Forest
618	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys sruhicunda</i>	Forest
619	Gramineae	<i>Phyllostachys</i>	<i>Phyllostachys rivalis</i>	Forest
620	Gramineae	<i>Gelidocalamus</i> Wen.	<i>G.stellatus</i>	Forest
621	Gramineae	<i>Chimonobambusa</i> Makino.	<i>Chimonobambusa marmorea</i>	Forest
622	Gramineae	<i>Pleioblastus</i>	<i>P.maculatus</i>	Forest
623	Gramineae	<i>Pleioblastus</i>	<i>Pleioblastus amarus</i>	Forest
624	Gramineae	<i>Pleioblastus</i>	<i>Pleioblastus altiligulatus</i>	Forest
625	Gramineae	<i>Pleioblastus</i>	<i>P. maculosoides</i>	Forest
626	Gramineae	<i>Pleioblastus</i>	<i>P.solidus</i>	Forest
627	Gramineae	<i>Pleioblastus</i>	<i>Pleioblastus sanmingensis</i>	Forest
628	Gramineae	<i>Pseudosasa</i>	<i>P.cantori</i>	Forest
629	Gramineae	<i>Pseudosasa</i>	<i>P.orthotropa</i>	Forest
630	Gramineae	<i>Pseudosasa</i>	<i>P.amabilis</i>	Forest
631	Gramineae	<i>Pseudosasa</i>	<i>Pseudosasa guanxianensis</i>	Forest
632	Gramineae	<i>Sinobambusa</i> Makino.	<i>Sinobambusa seminude</i>	Forest
633	Gramineae	<i>Sinobambusa</i> Makino.	<i>Sinobambusa tootsik</i>	Forest
634	Gramineae	<i>Sinobambusa</i> Makino.	<i>Sinobambusa tootsik</i>	Forest
635	Gramineae	<i>Sinobambusa</i> Makino.	<i>Sinobambusa intermedia</i>	Forest
636	Gramineae	<i>Acidosasa</i> C.	<i>Acidosasa edulis</i>	Forest
637	Gramineae	<i>Oligostachyum.</i>	<i>Oligostachyum scabriflorum</i>	Forest
638	Gramineae	<i>Sinobambusa</i> Makino.	<i>Sinobambusa tootsik</i>	Forest
639	Gramineae	<i>Alopecurus</i> L.	<i>Alopecurus aequalis</i> Sobol.	Terraces/Village
640	Gramineae	<i>Cynodon</i>	<i>Cynodon dactylon</i>	Forest/Terraces/Village /Stream
641	Gramineae	<i>Pennisetum</i>	<i>Pennisetum alopecuroides.</i>	Terraces/Village /Stream
642	Gramineae	<i>Eleusine</i>	<i>E leusine indica.</i>	Terraces/Village /Stream
643	Gramineae	<i>Setaria</i> Beauv.	<i>Setaria viridis.</i>	Terraces/Village /Stream
644	Gramineae	<i>Avena</i>	<i>Avena fatua</i> L.	Terraces/Village /Stream
645	Gramineae	<i>Digitaria</i>	<i>Digitaria sanguinalis.</i>	Terraces/Village
646	Gramineae	<i>Arthraxon.</i>	<i>Arthraxon hispidus.</i>	Terraces/Stream
647	Gramineae	<i>Miscanthus.</i>	<i>Miscanthus floridulu.</i>	Forest/Terraces/Village /Stream
648	Gramineae	<i>Lophatherum.</i>	<i>Herba Lophatheri.</i>	Terraces/Village /Stream
649	Gramineae	<i>Setaria</i> Beauv.	<i>Setaria plicata.</i>	Forest/Terraces/Village /Stream
650	Gramineae	<i>Setaria</i> Beauv.	<i>Setaria palmifolia.</i>	Forest/Terraces/Village /Stream
651	Gramineae	<i>Imperata</i> Cyr.	<i>Imperata cylindrica.</i>	Forest/Terraces/Village /Stream
652	Gramineae	<i>Phragmites</i> Adans.	<i>Phragmites australis</i> (Cav.) Trin. ex Steud	Terraces
653	Gramineae	<i>Coix</i> Linn.	<i>Coix lacrymajobi</i> L.	Terraces/Village /Stream
654	Gramineae	<i>Zea</i>	<i>Zea mays</i>	Terraces/Village
655	Gramineae	<i>Oryza</i>	<i>Oryza sativa</i>	Terraces
656	Gramineae	<i>Paspalum</i>	<i>Paspalum scrobiculatum</i> Linn.	Terraces/Village
657	Gramineae	<i>Panicum</i>	<i>Panicum repens</i> L.	Forest/Terraces/Village /Stream
658	Gramineae	<i>Poa</i>	<i>Poa annua</i> L.	Terraces/Village /Stream
659	Gramineae	<i>Zizania</i>	<i>Zizania latifolia</i>	Terraces/Stream
660	Zingiberaceae	<i>Alpinia</i>	<i>Alpinia zerumbet.</i>	Forest/Village /Stream
661	Zingiberaceae	<i>Alpinia</i>	<i>Alpinia japonica</i> Thunb.	Forest
662	Liliaceae	<i>Smilax</i> L.	<i>Smilax china</i> L.	Forest
663	Liliaceae	<i>Polygonatum</i>	<i>Polygonatum sibiricum</i>	Forest
664	Liliaceae	<i>Smilax</i> L.	<i>S.glabra</i> Roxb.	Forest
665	Liliaceae	<i>Lilium</i> L.	<i>Lilium brownii</i>	Forest
666	Liliaceae	<i>Paris</i> Linn.	<i>Paris polyphylla</i>	Forest
667	Liliaceae	<i>Allium</i>	<i>Allium fistulosum</i>	Terraces/Village
668	Liliaceae	<i>Allium</i>	<i>Allium cepa</i>	Terraces/Village
669	Liliaceae	<i>Allium</i>	<i>Allium sativum</i> L.	Terraces/Village
670	Liliaceae	<i>Allium</i>	<i>Allium chrysanthum</i>	Terraces/Village
671	Stemonaceae	<i>Angiospermae</i>	<i>Stemona sessilifolia</i>	Forest
672	Amarylidaceae	<i>Lycoris</i> Herb.	<i>Shorttube</i> Lycoris.	Terraces/Village /Stream

**Table 5: Animals Farmed in Lianhe Terrace**

Serial No	Family	Species	Distribution	Protection level
1	<i>Palaemonidae.</i>	<i>Freshwater shrimps.</i>	Terraces/Stream	
2	<i>Palaemonidae.</i>	<i>E.carinicauda.</i>	Terraces/Stream	
3	<i>Penaeeidae.</i>	<i>Fenneropenaeus chinensis.</i>	Terraces/Stream	
4	<i>Unionidae.</i>	<i>A. woodiana woodiana.</i>	Stream	
5	<i>Unionidae.</i>	<i>Plicata.</i>	Stream	
6	<i>Unionidae.</i>	<i>Anodonta woodiana woodiana.</i>	Stream	
7	<i>Limacidae.</i>	<i>Agriolimax agrestis</i> Linn.	Forest/Village /Terraces/Stream	
8	<i>Viviparidae.</i>	<i>Auriculata.</i>	Terraces/Stream	
9	<i>Viviparidae.</i>	<i>Cipangopaludina cahayensis.</i>	Terraces/Stream	
10	<i>Aiillpullaridae.</i>	<i>Pomacea canaliculata.</i>	Terraces/Stream	
11	<i>Pomatiopsidae.</i>	<i>Oncomelania hupensis</i> Gredler.	Terraces/Stream	
12	<i>Bradybaenidae.</i>	<i>Bradybaena kiangsinsensis.</i>	Forest/Village /Terraces/Stream	
13	<i>Achatinidae.</i>	<i>Achatina fulica.</i>	Forest/Village /Stream	
14	<i>Lumbricidae.</i>	<i>Lumbricus terrestris</i> Linn.	Forest/Village /Terraces/Stream	
15	<i>Haplotaxidae.</i>	<i>Haplotaxis gordioides.</i>	Forest/Village /Terraces/Stream	
16	<i>Nipponica.</i>	<i>Whitmania pigra</i> Whitman.	Terraces/Stream	
17	<i>Araneidae.</i>	<i>Nephila clavata</i> L.	Forest/Village /Terraces/Stream	
18	<i>Apidae.</i>	<i>Apis cerana cerana</i> Fabricius.	Forest/Village /Terraces/Stream	
19	<i>Apidae.</i>	<i>Apis melliferaligustica</i> Spinola.	Forest/Village /Terraces/Stream	
20	<i>Apidae.</i>	<i>Vespa.</i>	Forest/Village /Terraces	
21	<i>Vespidae.</i>	<i>Paper wasp.</i>	Forest/Terraces	
22	<i>Papilionidae.</i>	<i>Troides</i> Helena.	Forest/Village /Terraces/Stream	
23	<i>Papilionidae.</i>	<i>Atrophaneura horishana.</i>	Forest/Village /Terraces/Stream	
24	<i>Papilionidae.</i>	<i>Byasa alcinous.</i>	Forest/Village /Terraces/Stream	
25	<i>Papilionidae.</i>	<i>Byasa Menciuis.</i>	Forest/Village /Terraces/Stream	
26	<i>Papilionidae.</i>	<i>Graphium doson.</i>	Forest/Terraces/Stream	
27	<i>Papilionidae.</i>	<i>Ehana elwesi.</i>	Forest	
28	<i>Papilionidae.</i>	<i>Paranticopsis macareus.</i>	Forest/Village /Terraces/Stream	
29	<i>Pieridae.</i>	<i>Catopsilia Pomona.</i>	Forest/Village /Terraces/Stream	
30	<i>Pieridae.</i>	<i>Colias croceu.</i>	Forest/Village /Terraces	
31	<i>Psychodidae.</i>	<i>Psychodidae.</i>	Forest/Village	
32	<i>Staphylinidae.</i>	<i>Rove beetle.</i>	Forest/Village /Terraces/Stream	
33	<i>Chrysopidae.</i>	<i>Sympetrum Croceolum.</i>	Forest/Terraces	
34	<i>Cordulegasteridae.</i>	<i>Chlorogomphus papilio</i> Ris.	Forest/Village /Terraces/Stream	
35	<i>Cordulegasteridae.</i>	<i>Anotogaster sieboldii.</i>	Forest/Village /Terraces/Stream	
36	<i>Aeshnoidea.</i>	<i>Aeshna mixt.</i>	Forest/Village	
37	<i>Macromiidae.</i>	<i>Epophthalmia elegans.</i>	Forest/Terraces	
38	<i>Coenagrionidae.</i>	<i>Agriocnemis femina.</i>	Forest/Village /Terraces	
39	<i>Coenagrionidae.</i>	<i>Cercion plagiosum.</i>	Forest/Village /Terraces/Stream	
40	<i>Cicadidae.</i>	<i>Oncotumpana maculicollis.</i>	Forest/Village /Terraces	
41	<i>Cicadidae.</i>	<i>Cryptotympana atrata</i> Fabricius.	Forest/Village /Terraces	
42	<i>Cicadidae.</i>	<i>Platypleura kaempferi.</i>	Forest/Village	
43	<i>Cicadidae.</i>	<i>Cryptotympana atrata</i> Fabricius.	Forest/Village	
44	<i>Gryllidae.</i>	<i>Acheta domesticus.</i>	Village /Stream	
45	<i>Gryllidae.</i>	<i>Gryllus chinensis.</i>	Forest/Village	
46	<i>Gryllidae.</i>	<i>Loxoblemmus doenitzi.</i>	Forest/Village	
47	<i>Gryllidae.</i>	<i>Gryllodes sigillatus.</i>	Forest/Village /Terraces	
48	<i>Acrididae.</i>	<i>Locustamigratora.</i>	Forest/Village /Terraces/Stream	
49	<i>Acrididae.</i>	<i>Epacromius</i> spp.	Forest/Terraces/Stream	
50	<i>Acrididae.</i>	<i>Oedaleus</i> spp.	Forest/Terraces	
51	<i>Acrididae.</i>	<i>Omocestus</i> spp.	Forest/Village /Terraces/Stream	
52	<i>Acrididae.</i>	<i>Atractomorpha sinensis</i> Bol.	Forest/Terraces/Stream	
53	<i>Lucanidae.</i>	<i>Stag beetle.</i>	Forest/Terraces	
54	<i>Scolopendridae.</i>	<i>Scolopendra subspinipes.</i>	Forest/Village /Terraces	
55	<i>Kronopolites Svenhedini.</i>	<i>Spirobolus bungii.</i>	Forest/Village /Terraces/Stream	

56	<i>Kronopolites Svenhedini.</i>	<i>Spiroboles bungii</i> Brandt.	Forest/Village	
57	<i>Paratenosera.</i>	<i>Mantis.</i>	Forest/Village /Terraces	
58	<i>Phasmatidae.</i>	<i>Gongylolopus adyposus</i> Brunner.	Forest/Village /Terraces/Stream	
59	<i>Cerambycidae.</i>	<i>Cerambycidae.</i>	Forest	
60	<i>Tettigoniidae.</i>	<i>Longhorned grasshoppers.</i>	Forest/Terraces	
61	<i>Coccinellidae.</i>	<i>Rodolia rufopilosa</i> Muls.	Terraces/Stream	
62	<i>Coccinellidae.</i>	<i>Coccinella septempunctata.</i>	Terraces	
63	<i>Pyrrhocoridae.</i>	<i>Pantatomidae.</i>	Terraces	
64	<i>Curculionidae.</i>	<i>Cyrtotrachelus longimanus.</i>	Terraces/Village	
65	<i>Siluridae.</i>	<i>Silurus asotus.</i>	Terraces/Stream	
66	<i>Bagridae.</i>	<i>Pelteobagrus fulvidraco.</i>	Terraces/Stream	
67	<i>Channidae.</i>	<i>Channa argus.</i>	Terraces/Stream	
68	<i>Cyprinidae.</i>	<i>Carassius auratus.</i>	Terraces/Stream	
69	<i>Cyprinidae.</i>	<i>Mylopharyngodon piceus.</i>	Terraces	
70	<i>Cyprinidae.</i>	<i>Ctenopharyngodon idellus.</i>	Terraces	
71	<i>Nemipteridae.</i>	<i>Sinocyclocheilus grahami.</i>	Terraces/Stream	
72	<i>Cobitidae.</i>	<i>Misgurnus anguillicaudatus.</i>	Terraces/Stream	
73	<i>Clariidae.</i>	<i>Clarias fuscus.</i>	Terraces	
74	<i>Anguilla japonica.</i>	<i>Anguilla japonica.</i>	Terraces/Stream	
75	<i>Sciaenidae.</i>	<i>Nibeaalbeflora</i>	Stream	
76	<i>Trichiuridae.</i>	<i>Trichiurus haumela.</i>	Stream	
77	<i>Channidae.</i>	<i>Channa asiatica.</i>	Stream	
78	<i>Cichlidae.</i>	<i>Tilapia.</i>	Terraces/Stream	
79	<i>Ranidae.</i>	<i>Rana catesbeiana.</i>	Forest/Terraces	
80	<i>Ranidae.</i>	<i>Rana schmackeri.</i>	Forest/Village /Terraces/Stream	
81	<i>Ranidae.</i>	<i>Quasipaa spinosa.</i>	Forest	
82	<i>Ranidae.</i>	<i>Rana limnocharis</i> Boie.	Forest/Terraces	Class III National
83	<i>Ranidae.</i>	<i>Rana guentheri.</i>	Forest/Village /Terraces/Stream	
84	<i>Ranidae.</i>	<i>Rana rugulosa.</i>	Forest/Village /Terraces	Class II National
85	<i>Ranidae.</i>	<i>Rana plancyi.</i>	Forest/Terraces	
86	<i>Bufo nidae.</i>	<i>Bufo melanostictus</i> Schneider.	Forest/Village /Terraces/Stream	
87	<i>Bufo nidae.</i>	<i>Bufo gargarizans.</i>	Forest/Village /Terraces/Stream	Class III National
88	<i>Bufo nidae.</i>	<i>Toad.</i>	Forest/Village	
89	<i>Microhylids.</i>	<i>Microhyla onata.</i>	Forest/Village /Stream	
90	<i>Rhacophoridae.</i>	<i>Dennysi.</i>	Forest	
91	<i>Hylidae.</i>	<i>Hylachinensis.</i>	Forest/Stream	
92	<i>Viperidae.</i>	<i>Gloydius brevicaudus.</i>	Forest	Class III National
93	<i>Viperidae.</i>	<i>Medoggreenpitviper.</i>	Forest	Class III National
94	<i>Viperidae.</i>	<i>Deinagkistrodon .</i>	Forest	Class III National
95	<i>Boidae.</i>	<i>Python molurus.</i>	Forest	Class I National
96	<i>Boidae.</i>	<i>Python molurus molurus.</i>	Forest	Class I National
97	<i>Boidae.</i>	<i>Eryx.</i>	Forest	Class I National
98	<i>Colubridae.</i>	<i>Sinonatrix annularis.</i>	Terraces/Stream	Class III National
99	<i>Colubridae.</i>	<i>Enhydris plumbea.</i>	Terraces/Stream	Class III National
100	<i>Colubridae.</i>	<i>Red/backed rat/snake.</i>	Terraces/Stream	
101	<i>Colubridae.</i>	<i>Elaphe carinata.</i>	Terraces/Stream	Class III National
102	<i>Elapidae.</i>	<i>Bungarus multicinctus.</i>	Forest	Class III National
103	<i>Elapidae.</i>	<i>Kelloggi.</i>	Forest	Class III National
104	<i>Elapidae.</i>	<i>Ophiophagus Hannah.</i>	Forest	Class III National
105	<i>Elapidae.</i>	<i>Naja atra.</i>	Forest	Class III National
106	<i>Gekkonidae.</i>	<i>Ko japonicus</i> Dumeril.	Forest/Terraces	
107	<i>Gekkonidae.</i>	<i>Pogona vitticeps.</i>	Forest/Village /Terraces/Stream	
108	<i>Trionychidae.</i>	<i>Trionyx sinensis.</i>	Stream	Class III National
109	<i>Emydidae.</i>	<i>Chinemys reevesii.</i>	Stream	
110	<i>Corvidae.</i>	<i>Pica pica.</i>	Forest/Village /Terraces/Stream	Class III National
111	<i>Corvidae.</i>	<i>Corvus macrorhynchos.</i>	Forest/Village /Terraces	
112	<i>Muscicapidae.</i>	<i>Leucodioptron canorus.</i>	Forest/Terraces	Fujian
113	<i>Sturnidae.</i>	<i>Acridotheres cristatellus.</i>	Forest/Terraces	Class III National

114	<i>Hirundinidae.</i>	<i>Hirundo rustica.</i>	Forest/Village /Terraces/Stream	
115	<i>Oriolidae.</i>	<i>Oriolus chinensis.</i>	Forest	
116	<i>Phasianidae.</i>	<i>Francolinus pintadeanus.</i>	Forest/Village /Terraces/Stream	
117	<i>Phasianidae.</i>	<i>Phasianus colchicus.</i>	Forest	Class III National
118	<i>Columbidae.</i>	<i>Oena capensis.</i>	Forest/Terraces	
119	<i>Columbidae.</i>	<i>Columba.</i>	Forest/Village /Terraces	
120	<i>Columbidae.</i>	<i>Streptopelia turtur.</i>	Forest/Village /Terraces/Stream	
121	<i>Columbidae.</i>	<i>Streptopelia orientalis.</i>	Forest	Fujian
122	<i>Alcedinidae.</i>	<i>Alcedo atthis.</i>	Forest/Village /Terraces	
123	<i>Picidae.</i>	<i>Piculus.</i>	Forest/Village /Terraces/Stream	
124	<i>Anatidae.</i>	<i>Anatinae.</i>	Village /Terraces/Stream	
125	<i>Anatidae.</i>	<i>Anser cygnoides orientalis.</i>	Village /Terraces/Stream	
126	<i>Anatidae.</i>	<i>Anser anser.</i>	Forest/Village /Terraces	Class III National
127	<i>Strigidae.</i>	<i>Bubo bubo.</i>	Forest/Village /Terraces/Stream	Fujian
128	<i>Strigidae.</i>	<i>Glaucidium.</i>	Forest/Terraces	Fujian
129	<i>Strigidae.</i>	<i>Asio flammeus.</i>	Forest	
130	<i>Strigidae.</i>	<i>Asio otus.</i>	Forest	Fujian
131	<i>Accipitridae.</i>	<i>Aquila fasciata.</i>	Forest/Terraces	Class II National
132	<i>Accipitridae.</i>	<i>Spilornis cheela.</i>	Forest	Class II National
133	<i>Accipitridae.</i>	<i>Accipiter nisus.</i>	Forest/Terraces	Class II National
134	<i>Accipitridae.</i>	<i>Accipiter.</i>	Forest/Terraces	Class II National
135	<i>Accipitridae.</i>	<i>Ictinaetus malayensis.</i>	Forest	Class II National
136	<i>Centropodidae.</i>	<i>Centropus sinensis Stephens.</i>	Forest	Class II National
137	<i>Ardeidae.</i>	<i>Ardea purpurea.</i>	Forest/Village /Terraces	Class III National
138	<i>Ardeidae.</i>	<i>Little Egret.</i>	Forest/Stream	Class III National
139	<i>Ardeidae.</i>	<i>Ardea cinerea.</i>	Forest/Terraces/Stream	Class III National
140	<i>Falconidae.</i>	<i>Falco tinnunculus.</i>	Forest	Class II National
141	<i>Hystricidae.</i>	<i>Hystrix hodgsoni.</i>	Forest/Terraces	Class III National
142	<i>Suidae.</i>	<i>Sus scrofa.</i>	Forest/Terraces	Class III National
143	<i>Suidae.</i>	<i>Sus scrofa domestica.</i>	Village	
144	<i>Mustelidae.</i>	<i>Mustela sibirica.</i>	Forest	Class III National
145	<i>Mustelidae.</i>	<i>Lutra lutra.</i>	Stream	Class II National
146	<i>Felidae.</i>	<i>Felinae.</i>	Village	
147	<i>Cervidae.</i>	<i>Muntiacus crinifrons.</i>	Village	Class I National
148	<i>Cervidae.</i>	<i>Muntiacus reevesi.</i>	Forest	Class III National
149	<i>Erinaceidae.</i>	<i>Heterothermic.</i>	Forest	Class III National
150	<i>Sciuridae.</i>	<i>Callosciurus erythraeus.</i>	Forest	Class III National
151	<i>Sciuridae.</i>	<i>Dremomys perny.</i>	Forest	
152	<i>Circetidae.</i>	<i>Nesokia.</i>	Village	
153	<i>Leporidae.</i>	<i>L.sinensis.</i>	Forest/Terraces	Class III National
154	<i>Cercopithecidae.</i>	<i>Macaca mulatta.</i>	Forest	Class II National
155	<i>Ranidae.</i>	<i>Rana nigromaculataHallowell.</i>	Forest/Terraces	Class III National
156	<i>Ranidae.</i>	<i>Quasipaa spinosa.</i>	Forest/Terraces/Stream	
157	<i>Emydidae.</i>	<i>Mauremys mutica.</i>	Stream	Fujian
158	<i>Viperidae.</i>	<i>Green bamboo snake.</i>	Forest	
159	<i>Phalacrocoracidae.</i>	<i>Phalacrocorax carbo.</i>	Forest/Terraces	Fujian
160	<i>Felidae.</i>	<i>Neofelis nebulosa.</i>	Forest	Class I National
161	<i>Canidae.</i>	<i>Cuon alpinus.</i>	Forest	Class II National
162	<i>Canidae.</i>	<i>Canis lupus familiaris.</i>	Village	
163	<i>Limacidae.</i>	<i>Agriolimax agrestis.</i>	Forest/Village /Terraces	
164	<i>Manidae.</i>	<i>Manis.</i>	Forest	Class II National
165	<i>Phasianidae.</i>	<i>Coturnix coturnix.</i>	Forest/Village /Terraces	
166	<i>Circetidae.</i>	<i>Microtinae.</i>	Forest/Terraces/Village	



**Table 6: List of Microorganism in Lianhe Terrace**

Serial number	Family	Genus	Species	Distribution area
1	<i>Phallaceae.</i>	<i>Dictyophora.</i>	<i>Dictyophora indusiata.</i>	Forest/Terraces
2	<i>Hericiaceae</i>	<i>Hericium</i>	<i>Hericium erinaceus.</i>	Forest
3	<i>Tricholomataceae.</i>	<i>Tricholoma.</i>	<i>Tricholoma matsutake.</i>	Forest/Terraces
4	<i>Auriculariales.</i>	<i>Auricularia.</i>	<i>Auricularia auricular.</i>	Forest/Village
5	<i>Omphalotaceae.</i>	<i>Lentinus.</i>	<i>Lentinus edodes .</i>	Village /Terraces
6	<i>Pluteaceae.</i>	<i>Volvariella.</i>	<i>Volvariella volvacea .</i>	Village /Terraces
7	<i>Tremellaceae.</i>	<i>Tremella.</i>	<i>Tremella.</i>	Forest/Village /Terraces
8	<i>Russulaceae.</i>	<i>Russula.</i>	<i>Russula cyanoxantha .</i>	Forest
9	<i>Russulaceae.</i>	<i>Russula.</i>	<i>Russula fotens Pedrs .Fr.</i>	Forest
10	<i>Russulaceae.</i>	<i>Russula.</i>	<i>Russula vinosa Lin.</i>	Forest
11	<i>Bolbitiaceae.</i>	<i>Agrocybe.</i>	<i>Agrocybe aegirit.</i>	Forest/Terraces
12	<i>Russulaceae.</i>	<i>Russula.</i>	<i>Russula cyanoxantha .</i>	Forest
13	<i>Russulaceae.</i>	<i>Lactarius.</i>	<i>Lactarius deliciosus.</i>	Forest/Village /Terraces
14	<i>Agaricaceae.</i>	<i>Agaricus.</i>	<i>Agaricus campestris.</i>	Forest/Terraces
15	<i>Marasmiaceae.</i>	<i>Flammulina.</i>	<i>Flammulina velutipes.</i>	Forest/Terraces
16	<i>Marasmiaceae.</i>	<i>Marasmius.</i>	<i>Marasmius oreades.</i>	Forest/Village
17	<i>Pleurotaceae.</i>	<i>Agaricochaete.</i>	<i>Pleurotus sajorcaju.</i>	Forest/Terraces
18	<i>Tricholomataceae.</i>	<i>Isoptericola.</i>	<i>Termitomyces albuminosus.</i>	Forest
19	<i>Boletaceae.</i>	<i>Boletus</i>	<i>Boletus. Chalciaporus</i>	Forest
20	<i>Pleurotaceae.</i>	<i>Agaricochaete.</i>	<i>Pleurotus ostreatus .</i>	Forest/Terraces
21	<i>Auriculariaceae.</i>	<i>Auricularia.</i>	<i>Auricularia polytricha .</i>	Forest/Village
22	<i>Tremellaceae.</i>	<i>Tremella.</i>	<i>Tremella.</i>	Forest/Terraces
23	<i>Polyporaceae.</i>	<i>Ganoderma.</i>	<i>Ganoderma Lucidum Karst.</i>	Forest/Terraces
24	<i>Ganodermataceae.</i>	<i>Ganoderma.</i>	<i>Ganodermasinensis.</i>	Forest/Terraces
25	<i>Geastraceae.</i>	<i>Lycoperdon polymorphum.</i>	<i>Pisolithus tinctorius .</i>	Forest
26	<i>Tricholomataceae.</i>	<i>Oudemansiella.</i>	<i>Collybiaradicata.</i>	Forest
27	<i>Polyporaceae.</i>	<i>Antrodia</i>	<i>Antrodia camphorata.</i>	Forest

# Annex 5 Dynamic conservation plan for Chongyi Hakka Terraces

## 1. A baseline description of activities, policies and experiences

### 1.1 Institutional construction

In 2009, the *Opinions on Accelerating the Transfer of Contractual Rights of Land and Scale Operation in the Rural Areas* was released by the CPC Office and Government Office of Chongyi. Implementation of the programme promoted the land resources utilization with transferring more than 693.3 ha farmland with contracts signing in 2015, and increased the income of the farmers. By transfer contractual rights of land to large family farms and specialized farmer cooperatives, agriculture large-scale operation was promoted. The situation of land abandonment eased. In 2014, the Chongyi Hakka Terraces entered the second NIAHS list. In the same year, the Leading Group for Applying the GIAHS was set up. The Leading Group, headed by the County Magistrate, was made up by the directors of governmental departments. The office of the Leading Group was set up in the Agriculture and Food Bureau of the County. Five people have been designated to the office to prepare for the application. At the same time, a contract has been signed with the Institute of Geographic Sciences and Natural Resources Research of the China Academy of Science, the experts of which provide professional services for the application.

### 1.2 Capital investment

Integration with the initiatives of building new countryside and beautiful villages: China attaches great importance to rural affairs. The building of new countryside is one of the local governments' top priorities, while the building of beautiful villages has become a national development strategy. The Central Government requires governments at all levels to set up exclusive funds for these two initiatives, which can be leveraged to finance the protection of the agricultural heritage. This arrangement will promote the protection of the agricultural heritage and the building of rural areas at the same time.

The resources of the initiative to alleviate poverty by developing tourism can be leveraged to develop the Hakka Terraces system. In 2012, *the State Council's Opinions on Revitalizing and Developing Ganna and other Former Central Revolutionary Bases* was released. In 2013, *the Opinion on Supporting Tourism Development at Ganna and other Former Central Revolutionary Bases* was released by the National Tourism Administration. The document required the National Experiment Zone of Alleviating Poverty through Tourism to be set up in Ganzhou City. It also instructed that in the experiment zones, tourism products should be designed to make use of the competitive edges of the

area. According to this instruction, red tourism, rural tourism, eco-tourism and folk cultural tourism have been put forward. The Hakka Terraces system offers indigenous resources for eco-tourism and agricultural tourism. Therefore, the funds for related poverty alleviation can be used to develop tourism surrounding the Hakka Terraces system.

### **1.3 Eco-product development**

Building agricultural brands: Chongyi County has obtained the Pollution-Free Agricultural Product Certificate for one of its products, the Green Food Certificate for one product and the Organic Food Certificate for 6 products. The Chongyi Chinese Bramble Grape and “Chongyi Mountain Tea” are being certified as products with national geographic indication. Statistics show that the output value of these products is as high as 433 million yuan, accounting for more than 57% of the output value of all the agricultural products.

Building cultural brands: In 2012, the Hakka Terraces was named as the “Largest Hakka Terraces” by the Shanghai Great World Guinness Records. In 2014, the terraces were among the first to be named by the Ministry of Agriculture as “Beautiful Farms in China”. In 2013, the Shuinan Village of Shangbao became a pilot site of the Ministry of Agriculture’s initiative of building “Beautiful Villages”. Six institutions have been certified as provincial intangible cultural heritages, including Gaosheng, the rice wine making technique, the yellow ginger tofu making technique, and the spring cattle dance.

### **1.4 Tourism development**

Efforts have been made to attract rural migrant workers to move back to rural areas. For example, if organizations contract more than 6.67 ha of land, they will be treated as leading enterprises and given a number of credits. The loans can help them cope with seasonal or temporary shortage of funds. They will be given preferential treatment in accordance with relevant policies if they start businesses or engage in secondary and tertiary industries. The development strategies of "One Village One Product" and "One Village One Industry" have been implemented to achieve a reasonable industrial layout according to local situations. Making use of demonstrations by people who have made achievements--large-scale farmers, technology leaders and cooperative associations--the development of ingenious agricultural industries will be encouraged, such as the tea industry, greenhouse vegetables and grapes. These are the industries with good economic benefits and excellent potential. For example, the project of "*1000 mu of eco-rice paddy*" (1 ha equals 15 mu) was introduced in 2011 to townships such as Shangbao, China, and advocates poverty alleviation through tourism. Therefore, more preferential treatments are given to businesses and investors in eco-tourism at the Hakka Terraces and other key tourist sites. For instance, a project was launched in 2014 to improve the roads in the Hakka Terraces Tourist Site. Currently, Chongyi County has one provincial leisure agriculture demonstration site (the Hakka Terraces tourist site), one of the ten of Ganzhou’s "outstanding rural tourism demonstration sites" (the Longgou Mengyuan Orange Village), 9 representative leisure agriculture attractions, and 53 agro-entertainment sites.

## **1.5 Publicity and popularization**

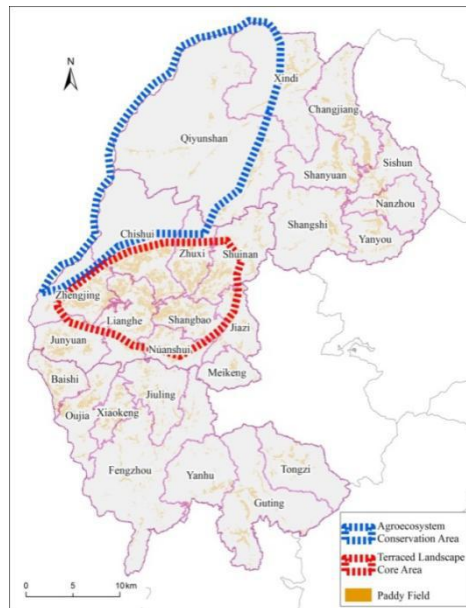
Several activities have been organized to advertise policies of protecting agricultural heritage and the circulation of rural land. Special focus has been placed on the following policies: *Notice on Identifying National Important Agricultural Heritage Systems*, the *Management Methods of National Important Agricultural Heritage Systems (Trial)*, *Law of the People's Republic of China on the Contracting of Rural Land* and the *Management Methods of Circulation of Rural Land Contracted Management Rights*. Local governments have organized training, such as "the organic rice production technology training" and "the new vocation training for farmers". Since 2010, more than ten such training sessions have been held each year. The themes of these training are vocational skills for the entire industrial chain. Special attention is given to production management and marketing. The aim is to train farmers in agricultural knowledge, skills and laws, and make them more interested in farming and better at it.

## **2. Activities for dynamic conservation and their expected results, fund raising and institutional involvement**

### **2.1 Activities for dynamic conservation**

Action plan will be designed to protect and develop the Hakka Terraces system, from the protection of biological diversity and traditional agriculture to agricultural industrialization and eco-tourism, etc. Function zones will be designated. Strong protection measures will be adopted in the proposed site, which will be the center of the development of multi-functional agriculture. A demonstration base will be constructed. These efforts will be gradually expanded to other areas of proposed site.

For the proposed site, the main goals are protecting agricultural and germplasm resources, the farmland and natural ecology, the landscapes, and tangible and intangible culture relating to agricultural history and production. Stringent protection measures will be adopted. Any industry and project that might affect the terrace landscape and the ecological environment will be subjected to evaluation and review. Industries and projects that fail the evaluation and review will be banned.



**Figure 1 Agro-ecosystem conservation area and terrace landscape core area**

As for the ecological reserve, the main function is creating a favorable ecological environment for planting ingenious crops, protecting biodiversity, and restoring natural landscapes. Activities for dynamic conservation are tasks of protecting the Agro-Ecology, Agri-culture, Agricultural Landscapes and developing Eco-Agriculture, Sustainable Tourism. The following will be described in detail of all the activities, tasks, targets.

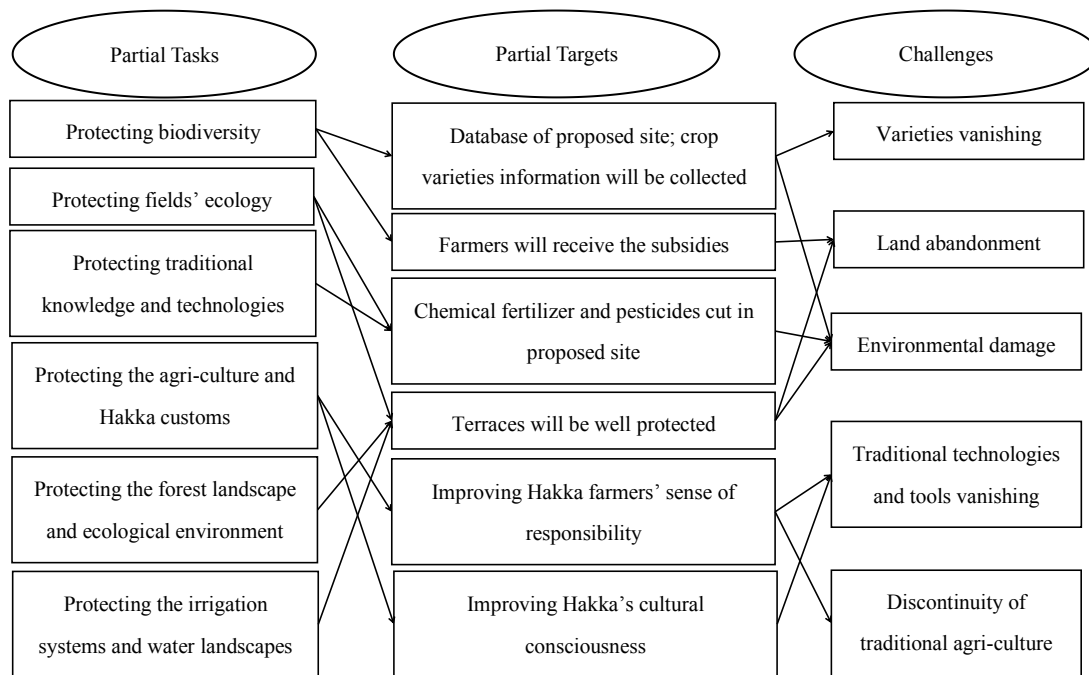
## 2.2 Expected results of activities

### (1) Protecting Agro-Ecology, Agri-culture, Agricultural Landscapes

The implementation of the plan will increase benefits of the Hakka Terraces system. For instance, the use of chemical fertilizer and pesticides will be cut by more than 70%. These tasks will meet and solve the challenges as land abandonment, traditional varieties vanishing.

The implementation of the plan will increase the ecological benefits of the Hakka Terraces system. For instance, the amount of chemical fertilizer will be lowered from 6,000 tons to 1,800 tons; pesticides from 37.1 tons to 9.5 tons in proposed site. Demonstration and experiment zones will be set up at the proposed site. Farmers will receive guidance in traditional agricultural approaches. Two to three technical procedures concerning traditional rice cultivation will be established. Traditional agricultural technologies of rice planting, and green and efficient eco-agricultural modes will be disseminated. The implementation of the plan will help maintain the water quality. The drinking water all meets water quality standards. The plan stipulates measures which will protect the ecological environment and improve the soil and water quality of the farmland. The protection of the terraces will maintain several eco-functions, which will help to conserve agricultural biodiversity, including rice varieties with different features, as well as all sorts of animal and botanic species. The protection and development of the Chongyi Hakka Terraces will enhance local people's understanding of traditional knowledge and management approaches. These will improve their capabilities to handle challenges presented by modernization. The combination of traditional culture and innovation will make the modern culture of Chongyi more comprehensive, coordinated and sustainable.





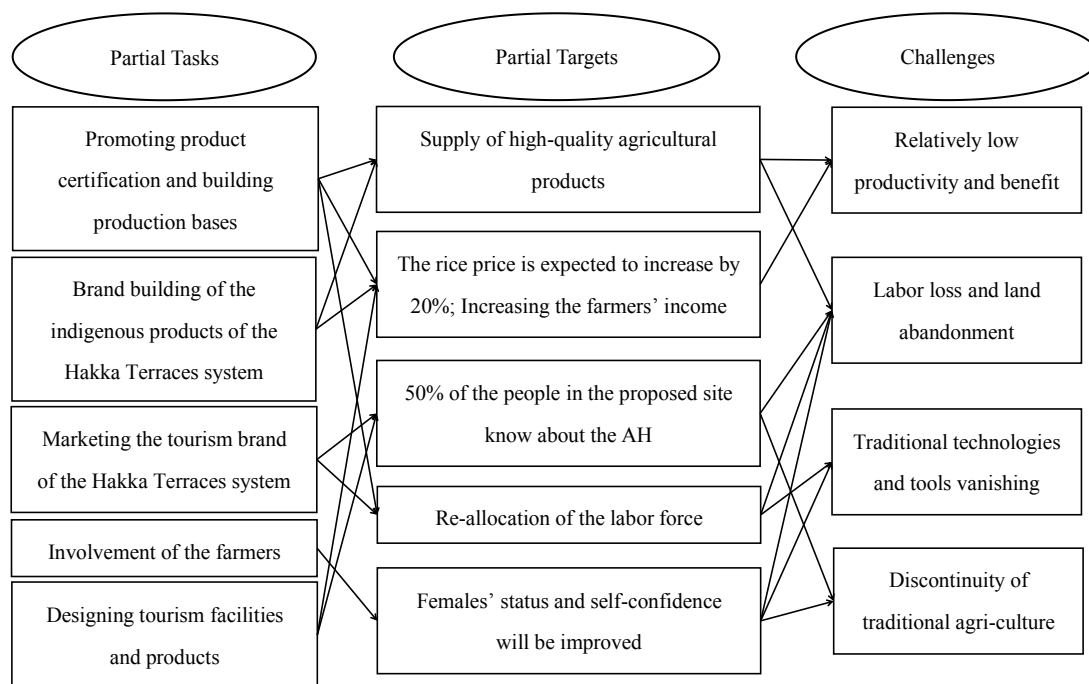
**Figure 2 Partial Expected results of Protecting the Agro-Ecology, Agri-culture, Agricultural Landscapes**

## (2) Developing Eco-Agriculture, Sustainable Tourism

Developing Eco-Agriculture, Sustainable Tourism will benefit to local economy and social development, and will solve the challenges as low productivity and benefits.

The supply of high-quality agricultural products will be safeguarded. There will be more deep-processing, which will increase the farmers' income. The implementation of the plan will strengthen brand building of eco-agricultural products. It will also eliminate the usage of chemical fertilizer and pesticides. Due to the improvement in quality, the rice price is expected to increase by 20%, which will improve the farmers' living standards. Compared with 2015, total agricultural output is expected to increase by 50% if the farmers make full use of the bamboo woods and the other crops in the terraces, and the crops and livestock in the woods. As a demonstration site, the total agricultural output and grain output are going to increase by as much as 20%. The rural economy will become more developed and will be able to remain stable in fluctuating markets. In addition, the development of the proposed site will drive the development of agricultural processing and infrastructure construction, which will also boost the economy of the county.

With the tasks implement, about 50% of the people in the proposed site and 80% of the leaders of all levels will know about agricultural heritages. Of the middle school students and pupils, 80% will know about agricultural heritages. The development of the Hakka Terraces system will drive the development of local companies and result in re-allocation of the labor force among agriculture, secondary industry, and tertiary industry. As to females, their social status and self-confidence will be improved by involving them more in the agricultural product processing, eco-tourism and other activities.



**Figure 3 Partial Expected results of Developing Eco-Agriculture, Sustainable Tourism**

## 2.3 Fund raising for activities

Capital supports will be obtained from several channels, which will go into the exclusive fund designated for the protection and development of the agricultural heritage. Following are the main financing channels.

**Ecological compensation:** Ecological compensation plays an important role in developing industries related to the Hakka Terraces system. The compensations for these industries (such as organic agriculture, tourism, etc.) will mainly be paid through government transfer. When deciding the amount of the compensations, the following factors will be considered: reasonable evaluation of the eco-functions of the Hakka Terraces system, the direct investment of the farmers in protecting the ecology of the Hakka Terraces system and their opportunity costs.

Preferential policies will be implemented, while more investment will be made. The protection of the Hakka Terraces system will be a key issue on the agenda of the CPC committee and government of Chongyi County. Fees will be designated for the daily operation of the campaign. Not only will the funds for rural development be used, but also poverty alleviation funds will be leveraged. In addition, funding can be obtained in the form of labour supports. The government should be supported in the key aspects, such as loans, financing, reduction and exemption of taxes and administration fees, water, electricity and land supply. Key leading enterprises will invest money in building their production bases, so that the community of interests will take shape.

In addition, financial and policy supports will be obtained from the World Bank and the Ministry of Agriculture. The leading enterprises will be encouraged to support the farmers with a proportion of their income. The Chongyi people who have migrated to foreign countries will be encouraged to invest in their hometown. In short, funding will be obtained from multiple channels.

## 2.4 Institutional involvement and embeddedness

Relevant departments will accelerate the approval and implementation of the *Plan of Protecting and Developing Chongyi Hakka Terraces, an Agricultural Heritage System*. Responsibility will be assigned as soon as possible.

The *Management Methods of Protecting and Developing Chongyi Hakka Terraces Agricultural Heritage System* will be formulated as soon as possible. The document will clarify the policies and measures for the protection and development of the Hakka Terraces system. Examples include preferential policies and stimulations for related industries, and approaches like monitoring, examination, period reporting, rewarding and punishment.

Collaboration Mechanism between these four sites of Rice Terraces Systems in Subtropical China will be set up. The Coordination Committee of Protection and Management of Rice Terraces Systems in Subtropical China will be established. Governments will build deeper contacts and set interactions between the sites under the management of the Committee.

*The Management Method of Using the Logo of Chongyi Hakka Terraces Agricultural Heritage System* will be formulated. It will stipulate the governing department, approval procedures, terms of use and evaluation methods.

A stimulation mechanism will be set up. Stringent evaluation will be conducted, the result of which will be used to decide the rewards and punishment. Government at all levels should implement effective stimulation policies. Rewards and honorary titles will be given to the departments, farmers, enterprises, farmer agents, scientists and technicians who make prominent contributions to protecting and developing the Hakka Terraces. Especially those farmers who plant indigenous species will receive subsidiaries. The capacity of contributing to the protection and development of the Hakka Terraces system will become an important criterion in nominating government officials for the proposed site.

### Schedule 1 Protecting the Agro-Ecology

Task	Actions and Targets	Implementing Department	Source of Fund	Amount of Fund (million yuan)	Year
Protecting biodiversity	A database will be built that store the basic data of proposed site, which will be analysed periodically. The evaluation will be performed by experts hired.	Bureau of Culture, Radio, Film and TV (BoCRFT); Bureau of Agriculture and Food (BoAF)	Central, Provincial financial appropriation	0.5	2017-2018
	Signs will be put up in the terraces of the 16 townships. They will be put on the protection list. Responsible persons will be identified. Information such as crop varieties, the amount of farmyard fertilizer and chemical fertilizer applied will be collected periodically.	BoAF	Science and Technology Plan of Ganzhou City project fund	0.3	2017-2020
	The area of the indigenous crops will be expanded. Financial subsidiary standards as 900 yuan/ha will be given to farmers in terraces.	BoAF	County financial appropriation	5.4	2020-2025
Protecting the ecology of the fields	Guidance of traditional agricultural approaches will be given to the farmers. Two to three technical procedures concerning traditional rice cultivation will be made. One to two traditional agricultural technologies of rice planting, and green and efficient eco-agricultural modes will be disseminated.	BoAF	Science and Technology Plan of Ganzhou City project fund	1.5	2020-2025
	Projects in the Hakka Terraces system will be strictly monitored. Destructive operation and construction activities will be banned. At the same time, punishment measures will be established.	Commission of Development and Reform (CoDR); Bureau of Environmental Protection (BoEP)	County financial appropriation	0.3	2017-2018
	The environment of the village will be improved. There will be concentrated disposal of domestic garbage, which will gradually cover 100% garbage. This will reduce the pollution and impacts on the landscapes caused by domestic garbage. Meanwhile, sewage processing will be improved.	BoEP	Central financial appropriation	2	2017-2018
	The villagers are encouraged to manage the forests, villages, terraces and water according to the rules. Twice a year, lectures on legal issues will be given to the officials and the public to enhance their awareness of the laws.	Township Governments; Justice Bureau	County financial appropriation	0.3	2017-2020

	The pollution criteria of the surface water will be kept under the levels of Grade III. Good water quality will be maintained.	BoEP; Water conservancy bureau	Central financial appropriation	1	2017-2018
	Farmyard manure and green manure will replace chemical fertilizer. Other biological technologies used to prevent and control pest and disease include bonfire, raising fish and ducks in the rice paddy fields. The usage of chemical fertilizer will be reduced by 70% by 2020.	BoAF	Central, Provincial financial appropriation	1	2017-2025
Monitoring and disseminating experience	Building beautiful villages will be planned. The villages will try to be selected as pilot projects of the Ministry of Agriculture's initiative to build beautiful villages.	BoAF	County financial appropriation	0.6	2020-2025
	One show about the Hakka Terraces system will be made every year, and will be publicized through TV, internet, lectures, outdoor advertisement and other advertisement media.	BoCRFT; Propaganda Department	County financial appropriation	0.6	2017-2018
	Online promotion and e-commerce will be used to find high-profile clients for the quality products from the Hakka Terraces system (alpine rice, high mountain tea and etc.).	BoAF	Municipal financial appropriation	0.3	2020-2025
	Six to nine stations will be constructed at the proposed site to monitor the protection and restoration of the terraces.	BoAF	Provincial financial appropriation	0.6	2020-2025
	Twice a year, agricultural technicians will give lectures in governmental departments and schools.	BoCRFT; BoAF	County financial appropriation	0.1	2017-2018

## Schedule 2 Protecting the Agri-Culture

Task	Actions and Targets	Implementing Department	Source of Fund	Amount of Fund (million yuan)	Year
Developing cultural consciousness of the Hakka Terraces system	An activity will be organized to select, recognize and award the “Agriculture Heritage Model Farmers”. Farmers who make special contributions will be nominated.	Bureau of Agriculture and Food (BoAF)	County financial appropriation	0.2	2017-2025
	Periodic lectures (two to three times per year) will be given at the villages to introduce the history and culture of Chongyi Hakka Terraces to the farmers.	Bureau of Culture, Radio, Film and TV (BoCRFT)	Provincial financial appropriation	0.2	2017-2025
	Introduction of the culture of Chongyi Hakka Terraces will be added to the textbooks of Jiangxi’s middle and primary schools, and the education plans.	Bureau of Education	Central financial appropriation	0.6	2017-2025
Protecting traditional knowledge and technologies relating to the Hakka Terraces system	The <i>Introduction of Agricultural Knowledge of Chongyi Hakka Terraces</i> and the <i>Brochure of Technologies for Chongyi Hakka Terraces</i> will be compiled and published. The target readers of these books will be farmers.	Bureau of Science and Technology (BoST)	Provincial financial appropriation	0.2	2017-2025
	The “Expert Forum on Protecting the Culture of Chongyi Hakka Terraces” will be held regularly. It will facilitate studies and exchanges of technologies and measures of protecting and developing the Hakka Terraces system.	BoST	Central financial appropriation	0.15	2017-2025
	An internship base will be set up for the students of the agriculture academy to study traditional agricultural knowledge and technologies.	BoAF	Central financial appropriation	0.5	2017-2025
Protecting the agri-culture and Hakka customs of the heritage system	The “Chongyi Hakka Terraces Agricultural Festival” will be held regularly. At these festivals, the Hakka religion, folk customs, folk songs and indigenous food will be presented through products, academic seminars and tourism ads.	Bureau of Tourism	County financial appropriation	2	2020-2025
	Calendars and postcards presenting the Hakka Terraces will be made, and handed out for free.	BoCRFT	County financial appropriation	0.2	2017-2025
	The Book of <i>Chongyi Hakka Terraces Agricultural Heritage</i> will be published.	BoAF; BoCRFT	County financial appropriation	0.2	2020-2025
	A logo for the Hakka Terraces system will be designed, which will stress two elements, namely the	BoAF	Provincial financial	0.2	2017-2018



	Hakka culture and the agri-culture of the system.		appropriation		
Protecting the tangible heritage	Items that embody the culture and history of the terraces will be collected, documented, displayed and protected. These items will be exhibited in Chongyi Hakka Terraces Museum to be built at Chongyi County. The museum is going to organize regular advertisement.	BoCRFT	Central, Provincial, County financial appropriation	6	2017-2018
	An exhibition hall of Hakka agri-culture will be built at Shangbao Township. Traditional agricultural knowledge of Hakka Terraces will be presented in forms as miniature landscapes, radio and video clips.	BoCRFT; Shangbao Township	County financial appropriation	2	2020-2025
	Exhibition rooms of agricultural heritage will be set up in key villages. The exhibition rooms, together with traditional festivities and performance, will present the agri-culture from different perspectives.	BoCRFT; Shangbao Township	County financial appropriation	1	2020-2025
Protecting the culture of Chongyi Hakka Terraces	The Chongyi Hakka Terraces Protection Committee will be set up, which will be made up of institutions of different levels. The interests of local farmers will be protected specially. A mechanism that involves the public and experts in the protection will be developed. The responsibilities of the governmental departments will be clarified.	Vice magistrate in charge of the affairs relating to agricultural heritage	County financial appropriation	0.3	2017-2018
	A non-governmental organization will be set up under the government's management and guidance. The organization will organize non-governmental activities related to the agri-culture, as well as cultural and education activities.	BoCRFT	County financial appropriation	0.1	2017-2018
	An exclusive fund will be set up to protect Chongyi Hakka Terraces. Funding will be obtained from the governments, collectives, and donations from the public. Management of the fund will be enhanced to ensure it is used exclusively in protecting the Hakka Terraces system.	Bureau of Finance	Central, Provincial, County financial appropriation	10	2017-2025
	Regulations for the protection of the terraces will be made, and will be aligned with the regulations and rules of local communities where appropriate.	BoAF		0.1	2020-2025
Protecting the intangible heritage	Chongyi boasts seven intangible heritages that are on the Intangible Heritage List of Jiangxi Province. The county will select one or two of them and get them certified as national intangible heritages.	BoCRFT	Provincial financial appropriation	0.2	2017-2025

	An initiative will be started to select the successors of the intangible heritage.	BoCRFT	County financial appropriation	0.15	2017-2025
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### Schedule 3 Protecting the Agricultural Landscapes

Task	Actions and Targets	Implementing Department	Source of Fund	Amount of Fund (million yuan)	Year
Protecting traditional Hakka villages and other rural landscapes	The layout of the villages will be improved, as well as the landscapes of the centre vacated villages. The village landscapes will stress the Hakka culture and should be harmonious with nature.	Bureau of Urban-Rural Development	Central, Provincial financial appropriation	5	2017-2025
	Public facilities will be gradually improved such as replacing the old toilets with new toilets. Biogas digesters will be promoted. Sanitary toilets will be put in all houses newly built in the rural areas.	Bureau of Environmental Protection (BoEP)	Biogas project fund	1	2020-2025
	Garbage processing plants will be constructed to dispose of domestic garbage. The level of non-hazardous processing of domestic garbage will be improved. The garbage storage/transportation system will be improved in key townships.	BoEP	Central financial appropriation	10	2020-2025
	The project of controlling the pollution caused by livestock breeding will be pushed forward.	BoEP; Bureau of Agriculture and Food (BoAF)	Central financial appropriation	4	2017-2020
Protecting the forest landscape and ecological environment	The protection of forest resources will be enhanced. More investment will be made in protecting natural reserves and forest parks for protecting biodiversity and improving ecological functions. The focus will be placed on protecting non-commercial forests, and controlling of water/ soil erosion and the ecological restoration of these basins. A demonstration zone of biodiversity conservation will be built in the Qingyun Mountain National Nature Reserve.	Bureau of Forestry	Central, Provincial financial appropriation	1.5	2017-2025
Protecting the irrigation systems and water landscapes	The project of protecting the Doushui Lake and the water ecology of the Niedu Township will be pushed forward.	BoAF	County financial appropriation	46	2017-2020
	Sewage processing plants will be constructed. No garbage will be allowed to be dumped or stored in the river courses or pools, so as to protect underground water.	BoEP	Central, County financial appropriation	20	2017-2025
	Quick action will be taken to repair irrigation and water conservancy facilities that are in poor	Bureau of Water	Central financial	6	2017-2018

	condition. The ridges and ditches in the fields will be repaired without harming the original ecology.	Resources (BoWR)	appropriation		
	A fund with stable supports will be designated for the maintenance and repair of water conservancy facilities and a stable team of engineers will be formed.	BoWR	Provincial, County financial appropriation	2	2017-2025
Protecting the terraces landscapes	Promoting the transfer of contractual rights of land. Farmers who contract more than 0.67 ha will be given direct national grain subsidies.	BoAF	Central, County financial appropriation	2	2017-2025
	Farmers who plant indigenous rice varieties will be entitled to subsidies for superior crop varieties.	BoAF	Central, County financial appropriation	2	2017-2025

#### Schedule 4 Developing Eco-Agriculture

Task	Actions and Targets	Implementing Department	Source of Fund	Amount of Fund (million yuan)	Year
Collecting basic data of the Hakka Terraces system	Making use of the data and information about eco-products that have already been collected, a database will be built at the County, while sub-databases will be built in all townships.	Bureau of Agriculture and Food (BoAF); Bureau of Statistics	County financial appropriation	0.6	2017-2018
	The accountability mechanism will be put in place to ensure that the area of the terraces will not shrink, and to reduce the proportion of abandoned fields.	BoAF	County financial appropriation	1.2	2017-2025
Promoting product certification and building production bases	Standards of eco-products of the Hakka Terraces system will be made. An organization will be designated to oversee the development of eco-products to ensure they are of high quality.	BoAF; Bureau of Financial Market Supervisory (BoFMS)	County financial appropriation	0.2	2017-2018
	The certification of Pollution-Free Agricultural Product, Green Food and Organic Agricultural Product will be promoted. Two to three organic agriculture demonstration bases will be constructed. Alpine rice, organic tea and bamboo will be planted at these bases.	BoAF	Ministry of Science and Technology fund	1.5	2017-2018
	The experience from the organic agriculture demonstration sites will be promoted to the other townships of the county by the end of 2020. The proportion of organic, green and pollution-free products will rise above 60%. The area of organic rice paddies will grow more than 400 ha (about 10%).	BoAF	Central, Provincial, County financial appropriation	6	2018-2020

	The output of products that have been certified as Pollution-Free Agricultural Product, Green Food, Organic Agricultural Product, and Product with Geographic Indication will be increased. The number of products that are certified will also be increased.	BoAF	Provincial, Municipal, County financial appropriation	0.5	2017-2025
	Famous and high-quality eco-rice brands will be promoted.	BoAF	Provincial, Municipal, County financial appropriation	0.6	2017-2025
Brand building of the indigenous products of the Hakka Terraces system	Three to five experimental fields and model farmers will be selected from the Shuinan Village, Chishui Village, Lianghe Village, Zhengjing Village and Zhuxi Village. These fields and the production will be monitored closely to improve product quality.	BoAF	Basic level agricultural technology extension project	0.5	2017-2018
	Standards will be formulated on certifying the products from the GIAHS/NIAHS. The certification will be promoted.	BoAF; BoFMS	County financial appropriation	0.3	2017-2025
	Demonstration areas will be built where traditional crops are planted, farmyard manure is applied and traditional agricultural technologies are used.	BoAF	Municipal science and technology project fund	0.6	2017-2025
	A professional marketing team will be set up. The popularity of the Hakka Terraces system will be improved by promotions conducted through radio, TV, micro blog, forums and other platforms.	Bureau of Culture, Radio, Film and TV (BoCRFT); Propaganda Department	Provincial, Municipal, County financial appropriation	1	2017-2025
Farmer training	Some experimental fields will be selected from proposed site for the exploratory usage of small manual tractors.	BoAF	County financial appropriation	0.2	2017-2025
	Farmer training on post harvesting and drying the products.	BoAF	County financial appropriation	0.2	2017-2025
Accelerating the development of agricultural processing	Market research will be conducted to promote agricultural processing.	BoAF	Capabilities improving of double-rice-producing region project	1.5	2017-2025
	Bamboo products and handcrafts will be promoted. When making bamboo into tools and appliances used in production or daily life, their cultural values should be stressed so as to	Shangbao, Sishun, Fengzhou Townships; Bureau of Forestry	Investment promotion	N/A	2017-2025

	increase the added value.				
	The handicraft industry will be industrialized. Inheritors of the yellow ginger, Chongyi rice wine and bamboo dragon lamp making skills will be trained.	BoCRFT	Provincial financial appropriation	0.3	2017-2025
Innovation of production and operation modes	Tax cuts, subsidiaries and returns will stimulate enterprises in the secondary and tertiary industries to invest in agriculture. Agricultural enterprises will continue to enjoy cuts in taxes, administrative fees, and interest rates.	BoAF; Bureau of Finance	County financial appropriation	0.5	2017-2025
	Market research on the surrounding provinces and cities will be conducted. The products will be promoted to these markets through the dealers.	BoAF; BoFMS	County financial appropriation	0.3	2017-2020
	The export channels of quality products will be expanded using overseas market research.	BoAF; Commercial Bureau	County financial appropriation	0.6	2021-2025
	All parties are encouraged to improve the scale and normativeness of specialized agricultural cooperatives from different perspectives and using different forms. There will be model cooperatives which have good results.	BoAF	Provincial, Municipal, County financial appropriation	0.6	2018-2025

### Schedule 5 Developing Sustainable Tourism

Task	Actions and Targets	Implementing Department	Source of Fund	Amount of Fund (million yuan)	Year
Positioning of the tourism	Tourism for agricultural heritage is incorporated into the tourism development plan of Chongyi County and Ganzhou City. Boutique travel routes will be designed. The layout of tourism resources will be improved.	Bureau of Tourism (BoT); Commission of Development and Reform (CoDR)	County financial appropriation	0.5	2017-2025
	Chongyi will strive to become a national demonstration site of leisure agriculture and rural tourism, selected by the Ministry of Agriculture and the National Tourism Administration.	BoT; Bureau of Agriculture and Food	County financial appropriation	0.3	2017-2025
Marketing the	The landscapes and products of the system will be embedded in or made into daily items	BoT	County financial appropriation	0.2	2017-2025

tourism brand of the Hakka Terraces system	for modern consumers.				
	Cartoons and comic games about the production and daily lives at the proposed site will be made.	BoT; Bureau of Culture, Radio, Film and TV (BoCRFT)	County financial appropriation	1	2017-2025
	The lives of local people will be made into TV series, micro-movies and movies.	BoT	County financial appropriation	20	2017-2025
Designing tourism facilities	The directions, themes and targets for the tourism development of the villages will be clarified. The tourism facilities and roads of several villages will be improved.	BoT; Bureau of Transportation	Provincial, Municipal, County financial appropriation	20	2017-2020
	The tourism facilities of Shuinan and Chishui Village will be improved. The style of the facilities will be more in line with the environment and culture of the proposed site.	BoT; Shangbao Township	Provincial, Municipal, County financial appropriation	10	2017-2020
Involvement of the farmers	A balanced benefit allocation mechanism will be put in place to attract high-quality capital while protecting the farmers' interest.	BoT	County financial appropriation	0.6	2017-2020
	Regular trainings on tourist reception and related knowledge will be conducted. These will strengthen local farmers' awareness in tourist reception and the protection of the terraces.	BoT	New type vocational farmers training fund	1	2017-2025
	The policy of "Culture Model Farmers" will be introduced. In-depth travel at the proposed site will be promoted.	BoT; BoCRFT	County financial appropriation	0.5	2017-2025
Tourism products	Different tourist products will be designed and promoted, including agricultural experience, sight-seeing, cultural experience, leisure tourism, science and education, festivities, performance and photographing.	BoT; BoCRFT	Provincial, Municipal, County financial appropriation	2	2017-2025
	Story-telling shows in the terraces will be created. Performance will also be put on the stage to display the culture.	BoT; BoCRFT	Provincial, Municipal, County financial appropriation	2	2017-2025
	Ingenious souvenirs will be put forward (such as alpine se-rich organic rice, high mountain tea in small packages, and bamboo handcrafts).	BoT	County financial appropriation	0.6	2017-2025
Tourism informationization	A website will be put online to provide comprehensive tourism information on Chongyi Hakka Terraces. The information will be updated on a daily basis.	BoT	County financial appropriation	0.6	2017-2017



	Hardware (such as terminals for inquiry and Wi-Fi) will be improved to meet the demands of tourists on DIY trips.	BoT; Bureau of Telecommunication;	Provincial, Municipal, County financial appropriation	6	2020-2025
	Panorama pictures of four seasons will be put online, so that the tourists can learn about the landscapes of the terraces at different seasons, altitudes and locations.	BoT; BoCRFT	County financial appropriation	0.6	2020-2025
	A tourism monitoring system will be launched to collect real time information about tourist safety. The system will also function as an early warning system.	BoT; Bureau of Environmental Protection (BoEP)	Central, Provincial, County financial appropriation	1	2020-2025
	APPs of tourism at Chongyi Hakka Terraces will be developed for different IT platforms (such as ISO and Android).	BoT	County financial appropriation	1.5	2020-2025
Protecting the ecological environment of the tourist sites	New energy, environmental friendly materials and environmental protection technologies will be used to realize low-carbon tourism and operation.	BoT; BoEP	Central, Provincial, County financial appropriation	1	2020-2025
	Food will be made into semi-prepared form before being taken into the core protection area, thus easing the burdens on the environment.	BoT; Bureau of Financial Market Supervisory	Central, Provincial, County financial appropriation	0.6	2020-2025
	Assessment of the villages' capacity for tourist accommodation will be conducted, the results of which will be used to control the number of tourists.	BoT	County financial appropriation	0.6	2020-2025
	Tourism will be concentrated in some villages for controlling the burden on the eco-system. A mechanism will be built to compensate and transfer tourism income to those villages without development of tourism.	BoT	County financial appropriation	1	2020-2025
	Conditional ecological compensations will be sought from national, provincial and municipal governments for the proposed site.	BoEP; CoDR; Bureau of Finance	County financial appropriation	1.2	2020-2025

# **Annex 6 Dynamic conservation plan for Longji Terraces**

## **1. A baseline description of activities, policies and experiences**

### **1.1 System conservation**

Since the application of the Longji Terraces as GIAHS was initiated, the leaders at all levels of the Longsheng County have paid high attention to the application, and a Leadership Group for the application was set up, with the head of the county as the group director, the deputy head of the county responsible for the heritage application as the vice director, the leaders of various departments of the county related to the application as group members.

#### **(1) Learning successful experiences**

In the process of the GIAHS application, Longji government has mastered the experiences for Terraces conversation through active communication and exchange with others, and learned to how to develop Longji Terraces along with its conversation.

#### **(2) Self- maintenance**

In the process of inspecting and repairing the terraced fields, the local farmers are responsible for regular inspections and repair work. The agricultural products in the terraced ecosystems are mainly organized by the local government to form cooperatives and develop the green, organic agricultural products. The funds required for the local heritage conservation and repair work are raised by the local government, the Longsheng tourism companies and the local residents. Longsheng government extracts 10% from tourism revenue for promoting the maintenance of the ecological landscape of terraced fields and cultural heritage.

#### **(3) Multi-party participation**

Protecting and developing the Longji Terraces agriculture cultural heritage involves many stakeholders, requires positively participation of all stakeholders. For example, by effectively implementing the villagers autonomy right about participating in managing the village to achieve virtuous circle of the village management and terraced production; in the development of eco-rural tourism, insisting the existing "agritainment" approach so that tourists stay in the village residents' home, on the one hand, it can mobilize the enthusiasm of various stakeholders to protect the cultural

heritage of agriculture, on the other hand, it can increase the income of terraced producers. In addition, we can gradually increase the return proportion of scenic spots for the villages to improve the enthusiasm of terraced producers in terraced fields.

## **1.2 Increasing investment for conversation**

Longji farming culture technology integration project with a total investment of 45 million *yuan*. The composition of investment: water conservancy project 21.48 million *yuan*, the terraced field repair about 2.66 million *yuan*, plantation project 16.7 million *yuan*, 3 million *yuan*'s terraced landscape works, the traditional way to protect farmland funds about 460,000 *yuan*, Longji agricultural products promotion project 700,000 *yuan*; The sources of total funds: the Longji tourism company invests 1.5 million *yuan*, the county government's financial support 1.5 million *yuan*, applying for 2 million *yuan* autonomous region government's invest, and applying for 40 million *yuan*.

## **1.3 Development of ecological agriculture**

Building Eco-Product Production Base: Delineate the organic production base, green production base and pollution-free production base for Longji tea, Longji Tonghe rice, Longji peppers. All the bases must observe the national quality control production standard and management methods for organic, green and pollution-free foods;

Implement standardized production:1) Do a good job in popularizing the stipulated quality control standards and high efficiency cultivation technique standard, and through carrying out standardized production, standardize the agricultural industries of the Longji Terraces;2)Institutionalize a complete set of monitoring and rewards and punishment system, upgrade the products quality and safety, stress on product features, and enhance the competitiveness of product market;

Build ecological brand:1) Through brand quality supervision and management, create and support 10-15 food production, processing factories,farmers collectives and eco-products brands with fine quality and prestige; 2) Make sure that each enterprise develops at least one farmers collective with certain production capacity and quite good output;

Push Product Advertising:1) Give a full play to the name-card effect of the Longji Terraces, and in combination of regional features, make full use of the internet and traditional media, and carry out a multi-level advertising for the traits of the Longji eco-products; 2) Attend or host characteristic agri-products exhibitions to expand their fame and popularity;

Certificate Eco-Products' Quality:Found a certificating committee with UNFAO, State Ministry of Agriculture, Natural and Cultural Heritage Research Center of China Academy of Sciences each offering five members, stipulate standards for agricultural heritage brand and progressively realize the organic certification of the Longji Terrace eco-agricultural products.

## **1.4 Eco-agricultural tourism for sustainable conversation**

The Longji Terraces tourism has been paid great attention to by the People's Government of Longsheng County. In 1993, the slogan of Poverty-Aid By Tourism was put forward by the Longsheng County, treating tourism industry as the pillar industry for the poverty-relief in Longji. In 2006, the Longsheng County was ranked as China Cultural Tourism Leading County, and the Longsheng Scenic Spot, the National Agricultural Tourism Demonstration Spot. The Longji Ancient Zhuang Villages was categorized in National Ancient Villages List in 2008, and the Longji Terraces area was awarded

Famous Villages (Towns) of National Characteristic Sightseeing Tourism in 2010. The Longji Terraces Area has been approved to be one of the key projects of the Midwestern Tourism Resources Development and Eco-Environment Protection by the State Government. The Guangxi Longji Eco-Museum was chosen as one of the first batch of five National Eco(Community)-Museum Demonstration Spots by the State Administration of Cultural Heritage in 2011. The Longji Terraces have become a living agri-folk-cultural museum.

The Longji Terraces Protection and Development Plan was approved by the People's Government of Longsheng County in May, 2014, and the Overall Plan of Guangxi Longji Scenic Zone (2013-2030) and the General Plan of Leisure Agriculture and Rural Travel of Longsheng All-Ethnic Autonomous County (2014-2020) were completed at the same time. The Protection and Management Methods of the Longji Terraces of Longsheng County, Guangxi Zhuang Autonomous Region was stipulated and effected in August, 2013, for the purpose of effectively protect the Longji Terraces farming culture and terraces tourism resources, effectively protecting and reasonably exploiting the terraces resources, and promoting the coordinated development of local economy. Guangxi Longji Terraces Agro-System was listed in the second CIAHS list in May, 2014, and the Longsheng All-Ethnic Autonomous County was rated as National Leisure Agriculture and Rural Tourism Demonstration County in December, 2014. The Longsheng All-Ethnic Autonomous County was entered in the first batch of National Forestry Tourism Demonstration County at China Forestry Tourism Festival on October 10, 2015, the only one in Guangxi, and the Longsheng County was also listed as the China Forestry Oxygen Bar Unit.

## **1.5 propaganda**

With collaborated efforts by the local governments and the CCTV, the Longji Terraces have been given special coverage in the CCTV column programs such as Native Soil, Service for You, and Synthesis Skill Bulletin. Various festivals, celebrations and promotional ceremonies have been sponsored by the local governments or related government organizations: the First Longsheng International Terrace Cultural Festival--China•Big Guilin Tourism Guangxi Hunan Primitive Eco-Folk Culture Festival, series of events or activities like Ploughing Festival, Torch Festival, Longji Golden Autumn Tourism Cultural Festival. Active involvement in the Third China Guilin International Tourism Fair, Advertisements on CCTV and People.Cn, Showcases held in other provinces, all these efforts effectively boost the prestige of the Longji Terraces.

## **2. Activities for dynamic conservation and their expected results, fund raising and institutional involvement**

### **2.1 Activities for dynamic conservation**

#### **(1) Strengthen agri-ecological Protection**

Implementation time is about 2014 to 2020, including:1) Germplasm survey and rescue, by

conducting surveys, categorizing and numbering the plant germplasm of the Longji Terraces, gathering detailed information, setting up wild plant resource data bank, taking prompt measures for serious drained, unbalanced growth, quantity shrinking germplasm to prevent the extinction of rare plant germplasm.;2) Survey and Restoration of Existing Water-Head Forest, by investigating the existing water-head forests, analyzing their functional status, putting forward good measures, stipulating perfect water-head forest protective measures, choosing suitable site to build small size reservoir, to ensure the terrace farming and residence water supply, and to improve the terrace production and sightseeing effect; 3) Survey on existing residential housing and need trend, by surveying on existing residential housing and need trend, setting up residential housing development plan, standardizing the building of residential houses and surveying the flow rate of tourist, controlling the size of tourists, so as not to exceed the reception capacity of the scenic spot;4) Household Refuse Treatment, by unifying dumping and burying of household garbage in garbage treat site, garbage collecting spots are set up for every 60 m service semi-diameter, sanitation workers are allocated, manures from public toilets are uniformly via equipped drainage system; 5) Drainage and Waste Water Treatment Project and Condition permitting. All the waste water of villages or towns in the protection zone are to be discharged to the waste water treating factory. When reaching the standard of water quality, the treated water can be used in irrigation, plant and animal breeding or even recycled for use. Other waster water that cannot be discharged to the waster water treatment factory is to be let off after it is treated in septic tank, biochemistry tank and bio-gas tank (Table 1-1).

## **(2) Strengthen the Agricultural Heritage Protection**

Implementation time is about 2017 to 2022, including:1) Survey and Gathering Agricultural Heritage in the Proposed Site. Extensive survey should be conducted on traditional farming culture, folklore, folk artists, ethnic craftsmanship skills, folk custom, ethnic mountain songs and rhymes, folk proverbs, all kinds of ancient buildings, etc. And their evolution history and changes should be described, for the purpose of better and further protection; 2) Offer the Longji Terrace cultural training classes. The Longji Terrace cultural training classes should be held on regular basis to deepen the understanding of agricultural heritage and its significance and enhance the pride and consciousness of protecting it;3) Build the Longji Terrace Farming Cultural Exhibition and Cultural Museum. Exhibition and Cultural Museum should be set up. Cultural Plazas should be built in Big Village, Lingji Village and other villages. The antiphonal mountain folk song singing event should be resumed (Table 1-2).

## **(3) Strengthen the Landscape Protection**

Implementation time is about 2017 to 2022, including:1) Basic Investigation and Protection Method Studies of the Longji Terraces. Conduct detailed survey on the use of the terraces within the protected zone, and set up landscape and buildings data-bank for analysis and appraisal and institutionalize the special department for monitoring and supervision. Set up the Research Center of the Longji Terraces and Ancient Building Protection, for conducting the proofing of the scenic spots and rural landscape protection;2) Ancient Building Renovation and Village Outlook Remediation in the Proposed Site. Systematically conduct ancient building renovation and village outlook remediation in

the proposed site, and the tourist reception facilities should be built in accordance with the standard, highlighting local styles and administrative method is used for strict control of the architecture style instead of at one own choice; 3) Apply for the National Characteristic Landscape and Traditional Village. Apply for the National Characteristic Landscape and Traditional Village and further push the application of the Longji Terraces Characteristic Landscape and Ancient Village, both are used to promote the protection of the agricultural heritage (Table 1-3).

#### **(4) Develop Eco-Product**

Implementation time is about 2017 to 2022, including:1) Build Eco-Product Production Base. Delineate the organic production base, green production base and pollution-free production base for Longji tea, Longji tonghe rice, Longji peppers. All the bases must observe the national quality control production standard and management methods for organic, green and pollution-free foods;2) Implement standardized production. Do a good job in popularizing the stipulated quality control standards and high efficiency cultivation technique standard, and through carrying out standardized production, standardize the agricultural industries of the Longji Terraces, Institutionalize a complete set of monitoring and rewards and punishment system, upgrade the products quality and safety, stress on product features, and enhance the competitiveness of product market; 3) Build ecological brand. Through brand quality supervision and management, create and support 10-15 food production, processing factories, farmers collectives and eco-products brands with fine quality and prestige. Make sure that each enterprise develops at least one farmers collective with certain production capacity and quite good output;4) Push Product Advertising. Give a full play to the name-card effect of the Longji Terraces, and in combination of regional features, make full use of the internet and traditional media, and carry out a multi-level advertising for the traits of the Longji eco-products; Attend or host characteristic agri-products exhibitions to expand their fame and popularity; 5) Certificate Eco-Products' Quality: Found a certificating committee with UNFAO, State Ministry of Agriculture, Natural and Cultural Heritage Research Center of China Academy of Sciences each offering five members, stipulate standards for agricultural heritage brand and progressively realize the organic certification of the Longji Terrace eco-agricultural products; 6) Improving the traditional grain drying methods, ensuring food security and food safety (Table 1-4).

#### **(5) Develop Leisure Agriculture**

Implementation time is about 2017 to 2022, including:1) Tourism Resources Survey and Appraisal. Complete a renewed and comprehensive survey on the tourism resources within the zone of the Longji Terraces and produce a regional tourism resource databank;2) Tourism Products Development: The spatial structure and its functional delineation of "two-zone-one-belt" of the Longji Terraces Scenic Zone play a role of guidance for the development of the scenic spot. So their resources features, product positioning and particular project design should be different;3) Leisure Agricultural Travel Routes Design: On the basis of existing routes, with the consideration of characteristics of sustainable leisure agricultural heritage tourism, as well as the tourist need of eating , lodging, traveling, purchasing, entertaining, etc, give priority to leisure agricultural sightseeing, "Happy Rural Inns" and



the like, and design more tourism routes to be built;4) Base Installation Construction:1) Planning the main roads in the Longji Terraces Scenic Zone; Tourists foot paths in the Longji Terraces Scenic Zone; Water supply and drainage projects;4) Public parking lots construction (Table 1-5).

## **(6) Cultivate Cultural Consciousness**

Implementation time is about 2017 to 2022, including:1) Popular Science Readings. Readings for leaders, handbooks for farmers, textbooks for primary or secondary school, involving agricultural heritage in campus exhibitions or school opening ceremonies: all these vehicles or opportunities can be employed to enhance the local mass' pride and feeling for the Longji Terraces, and the recognition of the importance of protecting them;2) Movie TV Advertising. Invite the famous directors to produce the Video Program The Number One Terraces in the World: the Longji Terraces, Yesterday, Today and Tomorrow in different lengths suitable to be played in different situations, introducing the Longji Terraces Agricultural Heritage and the tourism development there;3) Public Communication Through Books and Photos. Publish books on the protection of the Longji Terraces Agricultural Heritage. Invite famous writers, photographers, journalists to create essays, poetry, novels, photos on the protection of the Longji Terraces Agricultural Heritage;4) Net Advertising. While using the traditional media like newspaper, broadcasting and TV, resort to the Internet and auto-media such as micro-blog and micro-movies, so that the Longji Terraces Agro-System can be popularized in more vivid color and close to life;5) Holding Events. Based on the frequency needed for publicizing, attend, host or sponsor the academic activities and cultural and sports events, such as photography exhibition, and essay competitions (Table 1-6).

## **(7) Improve Management Capacity**

Implementation time is about 2017 to 2022, including:1) Farmers Training in the Proposed Site. Farmers training in the proposed site are an important measure of protection, and the farmers' participation in the protection is also a key link. An economic compensation system should be enacted to encourage more residents in the protected zone to engage in bio-products development and join the protection team of the Longji Terraces; 2) Talents Term Construction. Give full play to the leading role of core farmers in their influence on other farmers, cultivate the farm technician service awareness, build up a farmer-centered extension concept. Grasp the elementary skills of interactional training, stick to the principle of combining training and introduction, exploit the function of research term in ensuring the technique' s advance level and practical value. Improve the brand consciousness and management skills of the major readers and the management staff; 3) The Longji Terraces Technique Extension. Encourage the relevant government departments to cooperate with research institutes and universities. Popularize the existing research achievement and new techniques, draw on the advanced technique from other industries, found a specialized breeding basis to purify and strengthen the varieties of crops and provide fine seeds or seedlings for the protected zone. Offer technique guidance to the farmers in the zone, popularize planting experience, upgrade the technique level of individual farmers to a higher level. Build a specialized term for the protection of the Longji Terraces Agricultural Heritage; 4) Establish Development Fund of the Longji Terraces and Related Enterprises. Absorb social

capitals and expand the fund input. Make and implement funding support policies, found the Fund Committee for Guangxi Longji Terraces Protection and Development. A certain proportion of development funding should be allocated; 5) Construction of Digitalized Management System of the Longji Terraces. Introduce the modern high-tech, and monitor and supervise real-time the Longji Terraces management. Set up a digital management system to be applied to all the relevant functional department, found a police station in the Longji scenic spot, responsible for the local security; 6) Introducing modern machinery, in low-lying flat land (Table 1-7).

## **2.2 Expected results of activities**

### **(1) Strengthen agri-eco Protection**

Results: Preserving the ancient trees germplasm resources of the Longji Terraces mountainous areas, the agricultural biodiversity of the terraced fields and wild animals and plants, as well as the ecological environment within the system and the rational use of water and soil resources.

Challenges to respond to: Environmental pollution, abuse of fertilizer and pesticide, alien species invasion

### **(2) Strengthen the Agricultural Heritage Protection**

Results: Protecting ancient ruins, ancient buildings, ancient farm tools and other material culture and traditional knowledge, traditional skills, rural regulations, folk festivals, folk art and other non-material culture, restoring and developing Longji Terraces farming culture, especially the excellent ideological core and manifestations.

Challenges to respond to: The impact of modern civilization, the decline of traditional cultural identity and natural damage to the heritage.

### **(3) Strengthen the Landscape Protection**

Results: To protect the Longji Terraces landscape which consist of farmland, forest, water, grass and other materials, the rural landscape with local characteristics and the local unique traditional farming methods entire year, as well as to restore and repair ancient buildings, maintain rural village environment.

Challenges to respond to: The impact of modern civilization, low agricultural production revenue and natural damage

### **(4) Develop Eco-Product**

Results: To establish thorough government working mechanism of nurturing ,developing, motivating and protecting ecological products in Longji terraces, to nurture a group of business entities,

to build a batch of standardized ecological products production base, to train a number of brand building personnel, build the technical support platform and quality assurance platform meet ecological product brand development requirements, to form a group of strong domestic and international market competitiveness and influence of eco-products brand, to take the Longji Terraces ecological products into the national and international markets, and to improve the residents income and promote residents economic development.

Challenges to respond to: low agricultural production revenue and abuse of fertilizer and pesticide

## **(5) Developing Leisure Agriculture**

Results: Showing the landscapes of thousands of terraced fields and long terraced fields history, carrying out spectacular views of terraced fields, eco-cultural sightseeing, ancient community health and recreational activities, improving the income of the residents and promoting local economic development.

Challenges to respond to: low agricultural production revenue and the loss of labor force

## **(6) Cultivate Cultural Consciousness**

Results: To improve the awareness of the traditional agricultural systems cultural heritage' value and protecting cultural heritage's importance in the terraced fields, and to promote the enthusiasm of the stakeholders, especially the residents of the Longji terraces, to participate in the protection and development.

Challenges to respond to: The impact of modern civilization, the decline of traditional cultural identity and low agricultural production revenue

## **(7) Improve Management Capacity**

Results: To promote farmers and managers management ability of proposed sites in the Longji Terraces areas which can enhance the participation of stakeholders in the Longji Terraces cultural heritage, to promote the participation and protection of all ethnic groups in the Longji Terraces and to raise the various stakeholders' awareness and enthusiasm of realization value and protection of Longji Terraces cultural heritage. By using diversified business model to improve the income of farmers.

Challenges to respond to: The impact of modern civilization, the competition of same type scenic , lack of awareness of the service and low agricultural production revenue

## **2.3 Fund raising for activities**

The funds are mainly from three aspects: Longsheng County and the local government, Longji Terraces tourism management company and other related enterprises, as well as local residents ,and the proportion of capital contribution of investors are different. And some of the funds from the state and the Guangxi Zhuang Autonomous Region government financial support and subsidies.

## **2.4 Institutional involvement and embeddedness**

Longsheng County and local government departments, are supporting and involving of carrying responsibility for conversation and development, including the Agriculture Bureau, Forestry Bureau, Animal Husbandry Bureau, Tourism Bureau, Construction Bureau, Environmental Protection Bureau, Longsheng County Development and Reform Commission, Education Bureau, Longsheng County Radio and Television Bureau and Culture Bureau, Longji Terraces tourism management companies and other related enterprises and related research institutions to take part in.

**Table 1-1 Strengthen agri-eco Protection in the Longji terraces**

<b>Content</b>	<b>Action Plan Keypoint</b>	<b>Responsible Department</b>	<b>Implement Time</b>	<b>Detailed Measures</b>	<b>Source of funds</b>
<b>Strengthen agri-eco Protection</b>	Germplasm survey and rescue	Forestry Bureau	2017-2022	1. Conduct surveys, categorize and number the plant germplasm of the Longji Terraces, gather detailed information, set up wild plant resource data bank. 2. Take prompt measures for serious drained, unbalanced growth, quantity shrinking germplasm to prevent the extinction of rare plant germplasm.	Longsheng County and local government, Guangxi Zhuang Autonomous Region and National special funds account for 80%, Longji Terraces tourism management company accounts for 15%, and local people account for 5%
	Survey and Restoration of Existing Water-Head Forest	Agricultural Bureau, Forestry Bureau	2017-2022	1. Investigate the existing water-head forests, analyze their functional status, put forward good measures, stipulate perfect water-head forest protective measures. 2. Choose suitable site to build small size reservoir, to ensure the terrace farming and residence water supply, and to improve the terrace production and sightseeing effect.	
	Survey on existing residential housing and need trend	Construction Bureau, Tourism Management Bureau	2017-2022	1. Survey on existing residential housing and need trend, set up residential housing development plan, standardize the building of residential houses.2. Survey the flow rate of tourist, control the size of tourists, so as not to exceed the reception capacity of the scenic spot.	
	Household Refuse Treatment	Environmental Protection Bureau	2017-2022	Unified dumping and burying of household garbage in garbage treat site. Garbage collecting spots are set up for every 60 m service semi-diameter, sanitation workers are allocated, manures from public toilets are uniformly via equipped drainage system.	

	Drainage and Waste Water Treatment Project	Environmental Protection Bureau	2017-2022	Condition permitting, all the waste water of villages or towns in the protection zone are to be discharged to the waste water treating factory. When reaching the standard of water quality, the treated water can be used in irrigation, plant and animal breeding or even recycled for use. Other waster water that cannot be discharged to the waster water treatment factory is to be let off after it is treated in septic tank, biochemistry tank and bio-gas tank.	
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**Table 1-2 Strengthen the Agricultural Heritage Protection in the Longji terraces**

Content	Action Plan Keypoint	Responsible Department	Implement Time	Detailed Measures	Source of funds
<b>Strengthen the Agricultural Heritage Protection</b>	Survey and Gathering Agricultural Heritage in the Proposed Site	Broadcasting and TV Bureau, Cultural Bureau	2017-2022	1. Extensive survey should be conducted on traditional farming culture, folklore, folk artists, ethnic craftsmanship skills, custom, ethnic mountain songs and rhymes, folk proverbs, all kinds of ancient buildings, etc. 2. their evolution history and changes should be described, for the purpose of better and further protection.	Longsheng County and local government, Guangxi Zhuang Autonomous Region and National special funds account for 70%, Longji Terraces tourism management company accounts for 20%, and local people account for 10%
	Offer the Longji Terrace cultural training classes	Broadcasting and TV Bureau, Cultural Bureau	2017-2022	The Longji Terrace cultural training classes should be held on regular basis to deepen the understanding of agricultural heritage and its significance and enhance the pride and consciousness of protecting it.	
	Build the Longji Terrace Farming Cultural Exhibition and Cultural Museum	Broadcasting and TV Bureau, Cultural Bureau, Longji Terrace Tourism Management Company	2017-2022	1. Compile and publish the Longji Terrace cultural material with the Longji Zhuang Eco-Museum as a research institute. 2. The Longji Terrace Farming Cultural Exhibition and Cultural Museum should be set up. Cultural Plazas should be built in Big Village, Lingji Village and other villages. The antiphonal mountain folk song singing event should be resumed.	



**Table 1-3 Strengthen the Landscape Protection in the Longji terraces**

Content	Action Plan Keypoint	Responsible Department	Implement Time	Detailed Measures	Source of funds
<b>Strengthen the Landscape Protection</b>	Basic Investigation and Protection Method Studies of the Longji Terraces	Construction Bureau	2017-2022	1. Conduct detailed survey on the use of the terraces within the protected zone, and set up landscape and buildings data-bank for analysis and appraisal. 2. Institutionalize the special department for monitoring and supervision. Set up the Research Center of the Longji Terraces and Ancient Building Protection, for conducting the proofing of the scenic spots and rural landscape protection.	Longsheng County and local government, Guangxi Zhuang Autonomous Region and National special funds account for 60%, Longji Terraces tourism management company accounts for 20%, and local people account for 20%
	Ancient Building Renovation and Village Outlook Remediation in the Proposed Site	Construction Bureau	2017-2022	1. Systematically conduct ancient building renovation and village outlook remediation in the proposed site, and the tourist reception facilities should be built in accordance with the standard, highlighting local styles. 2. Administrative method is used for strict control of the architecture style instead of at one own choice.	
	Apply for the National Characteristic Landscape and Traditional Village	Tourism Bureau	2017-2022	Apply for the National Characteristic Landscape and Traditional Village and further push the application of the Longji Terraces Characteristic Landscape and Ancient Village, both are used to promote the protection of the agricultural heritage.	

**Table 1-4 Develop Eco-Product in the Longji terraces**

Content	Action Plan Keypoint	Responsible Department	Implement Time	Detailed Measures	Source of funds
<b>Develop Eco-Product</b>	Build Eco-Product Production Base	Government, Agricultural Bureau, Animal Husbandry Bureau	2017-2022	Delineate the organic production base, green production base and pollution-free production base for Longji tea, Longji tonghe rice, Longji peppers. All the bases must observe the national quality control production standard and management methods for organic,	Longsheng County and local government account for 60%,

				green and pollution-free foods.	related agricultural production enterprises and cooperatives account for 40%
Implement standardized production	Government, Agricultural Bureau, Animal Husbandry Bureau	2017-2022	Do a good job in popularizing the stipulated quality control standards and high efficiency cultivation technique standard, and through carrying out standardized production, standardize the agricultural industries of the Longji Terraces. 2. Institutionalize a complete set of monitoring and rewards and punishment system, upgrade the products quality and safety, stress on product features, and enhance the competitiveness of product market.		
Build ecological brand	Local Government, Relevant Enterprise	2017-2022	1. Through brand quality supervision and management, create and support 10-15 food production, processing factories, farmers collectives and eco-products brands with fine quality and prestige. 2. Make sure that each enterprise develops at least one farmers collective with certain production capacity and quite good output.		
Push Product Advertising	Longsheng County Government, Local Government, Relevant Enterprise	2017-2022	1. Give a full play to the name-card effect of the Longji Terraces, and in combination of regional features, make full use of the internet and traditional media, and carry out a multi-level advertising for the traits of the Longji eco-products. 2. Attend or host characteristic agri-products exhibitions to expand their fame and popularity		
Certificate Eco-Products' Quality	Agricultural Bureaus of Longsheng County and Local Towns, Governments of Longsheng County and Local Towns, Relevant	2017-2022	Found a certificating committee with UNFAO, State Ministry of Agriculture, Natural and Cultural Heritage Research Center of China Academy of Sciences each offering five members, stipulate standards for agricultural heritage brand and progressively realize the organic certification of the Longji Terrace eco-agricultural products; improving the traditional grain drying methods, ensuring		

		Enterprise and Research Institute		food security and food safety.	
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**Table 1-5 Develop Leisure Agriculture in the Longji terraces**

<b>Content</b>	<b>Action Plan Keypoint</b>	<b>Responsible Department</b>	<b>Implement Time</b>	<b>Detailed Measures</b>	<b>Source of funds</b>
<b>Develop Leisure Agriculture</b>	Tourism Resources Survey and Appraisal	Tourism Bureaus of Longsheng County and Local Towns	2017-2022	Complete a renewed and comprehensive survey on the tourism resources within the zone of the Longji Terraces and produce a regional tourism resource databank.	Longji Terraces tourism management company accounts for 50%, Longsheng County and local government account for 40%, local people account for 10%
	Tourism Products Development	Tourism Bureaus of Longsheng County and Local Towns	2017-2022	The spatial structure and its functional delineation of "two-zone-one-belt" of the Longji Terraces Scenic Zone play a role of guidance for the development of the scenic spot. So their resources features, product positioning and particular project design should be different.	
	Leisure Agricultural Travel Routes Design	Tourism Bureaus of Longsheng County and Local Towns	2017-2022	On the basis of existing routes, with the consideration of characteristics of sustainable leisure agricultural heritage tourism, as well as the tourist need of eating , lodging, traveling, purchasing, entertaining, etc, give priority to leisure agricultural sightseeing, "Happy Rural Inns" and the like, and design more tourism routes to be built.	
	Base Installation Construction	Tourism Bureaus of Longsheng County and Local Towns	2017-2022	1. Planning the main roads in the Longji Terraces Scenic Zone. 2. Tourists foot paths in the Longji Terraces Scenic Zone. 3. Water supply and drainage projects. 4. Public parking lots construction	

**Table 1-6 Cultivate Cultural Consciousness in the Longji terraces**

<b>Content</b>	<b>Action Plan Keypoint</b>	<b>Responsible Department</b>	<b>Implement Time</b>	<b>Detailed Measures</b>	<b>Source of funds</b>
<b>Cultivate Cultural Consciousness</b>	Popular Science Readings	Educational Bureau	2017-2022	Readings for leaders, handbooks for farmers, textbooks for primary or secondary school, involving agricultural heritage in campus exhibitions or school opening ceremonies: all these vehicles or opportunities can be employed to enhance the local mass' pride and feeling for the Longji Terraces, and the recognition of the importance of protecting them.	Longsheng County and local government account for 90%,Longji Terraces tourism management company accounts for 10%
	Movie TV Advertising	Broadcasting and TV Bureau, Cultural Bureau	2017-2022	Invite the famous directors to produce the Video Program The Number One Terraces in the World: the Longji Terraces, Yesterday, Today and Tomorrow in different lengths suitable to be played in different situations, introducing the Longji Terraces Agricultural Heritage and the tourism development there.	
	Public Communication Through Books and Photos	Broadcasting and TV Bureau, Cultural Bureau	2017-2022	1. Publish books on the protection of the Longji Terraces Agricultural Heritage. 2. Invite famous writers, photographers, journalists to create essays, poetry, novels, photos on the protection of the Longji Terraces Agricultural Heritage.	
	Net Advertising	Local Government	2017-2022	While using the traditional media like newspaper, broadcasting and TV, resort to the Internet and auto-media such as micro-blog and micro-movies, so that the Longsheng Longji Terraces Agro-System can be popularized in more vivid color and close to life.	

	Holding Events	Local Government	2017-2022	Based on the frequency needed for publicizing, attend, host or sponsor the academic activities and cultural and sports events, such as photography exhibition, and essay competitions.	
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**Table 1-7 Improve Management Capacity in the Longji terraces**

<b>Content</b>	<b>Action Plan Keypoint</b>	<b>Responsible Department</b>	<b>Implement Time</b>	<b>Detailed Measures</b>	<b>Source of funds</b>
<b>Improve Management Capacity</b>	Farmers Training in the Proposed Site	Governments of Longsheng County and Local Towns, Relevant Enterprise and Research Institute	2017-2022	Farmers training in the proposed site is an important measure of protection, and the farmers' participation in the protection is also a key link. An economic compensation system should be enacted to encourage more residents in the protected zone to engage in bio-products development and join the protection team of the Longji Terraces.	Longsheng County and local government account for 100%
	Talents Term Construction	Governments of Longsheng County and Local Towns, Relevant Enterprise and Research Institute	2017-2022	Give full play to the leading role of core farmers in their influence on other farmers, cultivate the farm technician's service awareness, build up a farmer-centered extension concept. Grasp the elementary skills of interactional training, stick to the principle of combining training and introduction, exploit the function of research term in ensuring the technique's advance level and practical value. Improve the brand consciousness and management skills of the major readers and the management staff	
	The Longji Terraces Technique Extension	Agricultural Bureau and Forestry Bureau of Longsheng County	2017-2022	Encourage the relevant government departments to cooperate with research institutes and universities. Popularize the existing research achievement and new techniques, draw on the advanced technique from other industries, found a specialized breeding basis	

				to purify and strengthen the varieties of crops and provide fine seeds or seedlings for the protected zone. Offer technique guidance to the farmers in the zone, popularize planting experience, upgrade the technique level of individual farmers to a higher level. Build a specialized term for the protection of the Longji Terraces Agricultural Heritage.	
	Establish Development Fund of the Longji Terraces and Related Enterprises	Government of Longsheng County and Local Towns, Development and Reform Committee of Longsheng County	2017-2022	Absorb social capitals and expand the fund input. Make and implement funding support policies, found the Fund Committee for Guangxi Longsheng Longji Terraces Protection and Development. A certain proportion of development funding should be allocated.	
	Construction of Digitalized Management System of the Longji Terraces	Governments of Longsheng County and Local Towns, Research Institute	2017-2022	Introduce the modern high-tech, and monitor and supervise real-time the Longji Terraces management. Set up a digital management system to be applied to all the relevant functional department, found a police station in the Longji scenic spot, responsible for the local security; 6) Introducing modern machinery, in low-lying flat land.	



# Annex 7 Dynamic conservation plan for Xinhua Ziquejie Terraces

## 1. A baseline description of activities, policies and experiences

### (1) Construction of institutional mechanisms

A management agency was established in the Ziquejie Terraces. Its functions were clearly defined as scientific research, scientific propaganda, conservation of proposed sites, and tourism services. *“Interim Protection Measures for the Ziquejie-Meishan Palace scenic area”* was also issued to promote the protection and management of the Ziquejie Terraces. In order to encourage local farmers to grow traditional high-quality agricultural products, the government developed a series of seed subsidy management practices and standards, and also provided guidance of planting technology for farmers.

### (2) Funding and projects investment

The government of Xinhua County pays more attention to the protection of agricultural culture and landscape. The government has successively invested more than 200 million RMB to carry out various heritage conservation projects in the Ziquejie Terraces, including terraced field protection projects, natural gravity irrigation system restoration projects, comprehensive management projects of small watershed ecological environment, folk song training programs, residential landscape construction projects and viewing platform construction projects in scenic areas and others. The government also has taken the protection and development of Xinhua folk songs as one of its strategic tasks. In early 2005, a leading group of “Folk cultural Heritage Rescue Project of Xinhua County” was set up and the “folk music and folk literature editorial team” was organized to compile local folk songs of Xinhua County as pilot teaching materials. Ten folk song teams were organized to conduct training work at the early stage. Folk art workshops were held to fully tap local Nuo opera, martial arts, dance and folk grass dragon and other cultural resources of Shuiche Town. The troupe of folk customs and culture performing art was formed and had carried out a total of more than 10 cultural performances. In 2006, the “the Fourth Meishan Academic Seminar on Culture and the First Meishan Tourism and Culture Festival of China” was held. In the following years, “World Terraced Fields Seminar in Ziquejie”, “Seminar of Culture and Tourism Cooperation of Great Meishan”, “Dialogue of Liao Meixiang, the Leading Authority of Northern School of Yi-ology in Ziquejie”, “Terraced Fields Heritage Protection Seminar in Ziquejie” and other special academic research conferences were organized and held in succession to effectively promote the cultural excavation and landscape protection in the Ziquejie Terraces. More than 80 researchers and enthusiasts of Meishan culture participated in the “Seminar of the Excavation and Compiling of Tourism Resources of Meishan Culture” which was held in 2013, with the eldest of 82 and the youngest of only 25 years old.

### (3) Ecological product development and brand building

The government actively promotes the industrialization of organic agriculture and has contributed to the establishment and development of 23 agricultural enterprises in Xinhua County, among which 8 are located in Ziquejie Terraces. These agricultural enterprises are led by Hunan Zinong Agriculture & Forestry Investment Limited Liability Company, Ziquejie Branch of the Hunan Longping Hi-tech Specialized Grain Cooperative Association, and Hunan Zique Manor Ecological Agricultural Development Limited Liability Company. At present, some of these enterprises have been certified as national pollution-free agricultural products, green agricultural products, organic agricultural products, or received the geographical indications certification. They have established the brand of “purple tribute rice” and also adopted the business model by integrating enterprises, cooperatives, production bases and farmers to take advantages of the national land transfer policy in the implementation of standardization demonstration base construction projects of black rice and red rice in the Ziquejie Terraces, to develop it as the national demonstration bases of organic rice planting.

#### **(4) Sustainable Tourism Development**

In order to fully demonstrate the multiple values of the Ziquejie Terraces, the Xinhua County attaches great importance to the in-depth excavation of agricultural culture in the Ziquejie Terraces and proposes to take it as the core to develop the multifunctional agriculture in the system by the integrating of tourism development, agricultural products processing, food culture and other aspects. , Xinhua County government has listed development of cultural tourism industry as the “No.1 Project” of the county and established the “Leading Group of Industries with Cultural Tourism Characteristic in Xinhua County” and “Xinhua County Cultural Tourism Investment Co., Ltd.”. Focusing on the Meishan Dragon Palace, Big Bear Mountain National Forest Park, Ziquejie Terraced Fields and other scenic areas, the government continuously expands the influences of the Ziquejie Terraces by strengthening tourism promotion activities and organizing tourism recommendation fairs and festivals.

#### **(5) Propaganda and Popularization**

In order to effectively promote Ziquejie Terraces, a series of thematic traditional arts and cultural activities was organized and held. A variety of media have increased the publicity about the agricultural culture in the Ziquejie Terraces. The traditional farming culture museum was constructed and opened in the Ziquejie Terraces. In order to promote Xinhua folk songs as an outstanding folk culture tourism business card, Xinhua County government invested 150,000 RMB to coordinate and organize a professional team to create and rehearse a large scale folk song opera entitled Mountain Treasures led by the Cultural Troupe of Xinhua County. In September 2011, the first International Rice Cultural Festival and Outdoor Living Festival in the Ziquejie Terraces were held. In 2012, the Chinese Photographers Association organized thousands of photographers nationwide to gather at the Ziquejie Terraces to jointly hold the First Tourism and Culture Festival of Great Meishan, attracting numerous media reports and many guests at home and abroad. Lots of other activities have been organized and held in the Ziquejie Terraces to expand influences and impacts, such as “Chiyou Hometown-Meishan of Xinhua” National Photography Contest, “Ziquejie Cup” English TV Contest, and “Magic Great Meishan, Explore Ziquejie”. In addition, a documentary named “Walking on the table” has been made and played by CCTV 9 to promote local food culture and cultural landscape. The Ziquejie Terraces have been recognized as the “Hometown of Meishan Culture and Arts ”, “Hometown of Chinese Poetry”, “Hometown of National Martial Arts”, “Hometown of Chiyou”, “Hometown of Chinese Folk Culture and Arts”, and so on.

## **2. Activities for dynamic conservation of Xinhua Ziquejie Terraces and their expected results, fund raising and institutional involvement**

### **2.1 Activities for dynamic conservation**

In order to promote the protection and development of Ziquejie Terraces, a series activity were proposed to be implemented in the near future. The agriculture ecosystem of Ziquejie Terraces will be conserved by protecting biodiversity, farmlands, forests, and rural areas, and monitoring the agriculture ecosystem protection at the same time (see Annex 7-Table 1). The traditional farming knowledge and culture will be protected by excavating the traditional farming knowledge and skill, folk art, and food culture, collecting traditional farming tools, establishing farming culture museums, constructing the long-term publicity and education mechanism (see Annex 7-Table 2). The agricultural landscape will be conserved by protecting forests, irrigation systems, terrace landscapes, and traditional villages (see Annex 7-Table 3). The eco-agriculture will be developed by surveying traditional crop varieties, popularizing traditional farming technologies, optimizing Layout of eco-agriculture, cultivating and certifying eco-products, deep processing agricultural products, developing functional food, promoting agriculture products and brand building, cultivating new types of agricultural businesses of traditional agriculture products (see Annex 7-Table 4). The recreational agriculture will be developed by designing recreational agriculture tour routes, producing more recreational agriculture products, optimizing infrastructures, and improving the management mechanism of recreational agriculture (see Annex 7-Table 5). With the implementation of the action plans about the protection and development of Ziquejie Terraces, local farmers and local governments are the most potential beneficiaries.

In order to ensure the successful implementation of the protection and development measures, a series of action for improving awareness of local traditional culture and local management ability. The awareness of local traditional culture can be improved by educating officials, students, and farmers, publicizing Ziquejie Terraces as an agricultural heritage through all kinds of media, holding academic activities, photographic exhibitions, and essay competition, and so on. The management ability can be improved by setting up specialized management department, establishing rules and regulations, carrying out agricultural heritage training for technicians, managers and entrepreneurs, establishing Agricultural Heritage Fund, and so on.

**Table 1 Detailed actions for protecting agricultural ecosystem of Ziquejie Terraces**

Measures	Action Plan	Responsible Departments of Xinhua County	Source of Fund	Amount of Fund (million yuan)	Implementing Period
Protecting biodiversity	Survey the biodiversity within terraces and forest systems	Forestry Bureau	County financial	0.1	2015-2017
	Construct law enforcement team of ecological protection	Forestry Bureau	County financial	0.5	2015-2017
	Register the property right of ecological resources	Land and Resources Bureau	County financial	0.05	2015-2020
	Strengthen protection of endangered species of wild fauna and flora	Forestry Bureau	County financial	0.6	2015-2025
Protecting farmlands	Catch of frogs, snakes and fish with electric devices are prohibited	Agriculture Bureau	County financial	0.05	2015-2017
	Promote the compound ecological agricultural farming and breeding patterns(duck farming and fish breeding in paddy fields)	Agriculture Bureau	Central and county financial	1	2015-2020
	Strengthen protection and maintenance of natural irrigation system	Water Conservancy Bureau	Central and county financial	1.7	2015-2025
Protecting forests	Establish biodiversity archive of forest vegetation	Forestry Bureau	County financial	0.05	2015-2017
	Register the forest resources property right and clarify the forestry property rights	Forestry Bureau	County financial	0.1	2015-2020
	Establish and divide soil and water conservation forest, ecological forest and functional forest area, and set up the signs	Agriculture Bureau	County financial	0.2	2015-2020
Protecting rural areas	Strengthen the construction of methane tank to make full use of human and animal waste	Agriculture Bureau	Central and county financial	1.2	2015-2020
	Protect drinking water sources in rural areas	Water Conservancy Bureau	County financial	0.4	2018-2020
Monitoring agriculture ecosystem protection	Establish ecological observatory in core area of proposed site	Agriculture Bureau	Central and county financial	0.8	2015-2017
	Establish monitoring and warning system of natural disasters in core area of proposed site	Weather Bureau	County financial	0.1	2015-2017
	Establish and improve the crop ecological safety monitoring system, and set up related liaisons in each village and group	Agriculture Bureau	County financial	0.2	2018-2020

**Table 2 Detailed actions for protecting traditional agricultural knowledge and culture of Ziquejie Terraces**

Measures	Action Plan	Responsible Departments of Xinhua County	Source of Fund	Amount of Fund (million yuan)	Implementing Period
Excavating traditional farming knowledge	Establish special investigation team to widely collect traditional proverb, traditional poetic couplet, traditional farming methods, and other knowledge and skills about traditional farming in proposed site	Culture Bureau	County financial	0.2	2015-2017
	Classify the above information and establishing systematic recording materials with words, images and video, etc.	Culture Bureau	County financial	0.2	2018-2025
Collecting traditional farming tools	Collect traditional farming tools, such as squared barrels , bamboo mat, dragon-bone waterwheel, and so on	Culture Bureau	Provincial financial	0.3	2015-2020
Collecting traditional folk art knowledge	Collect and classify related data and literature records of Nuo opera, Nuo dance, Nuo Mask Lion Dance, traditional festivals, traditional customs and traditional arts	Culture Bureau	Provincial financial	0.5	2015-2020
	Compile the corresponding audio, video and other data through modern digital methods	Culture Bureau	Provincial financial	0.8	2018-2025
Collecting traditional food culture knowledge	Document traditional food culture, for example the processes and recipes of traditional snacks, tea, wine, etc.	Culture Bureau	County financial	0.4	2015-2020
	Compile the corresponding recording data, such as video and photos, as well as text materials	Culture Bureau	County financial	0.4	2018-2025
Establishing farming culture	Establish traditional knowledge museum of traditional farming and exhibit relevant video and photos and other information collected	Culture Bureau	Central and county financial	1	2015-2020

museums	Set up specialized personnel and funds safeguard mechanism	Culture Bureau	County financial	0.8	2018-2025
Establishing digital protection mechanism	Provide digital display and network transmission of traditional farming knowledge, technology and equipment as well as folk arts and to establish special research and development and technical safeguard mechanism to promote the sustainable and digitalized inheritance of heritage culture	Culture Bureau	County financial	0.2	2018-2025
Constructing long-term publicity and education mechanism	Set up training mechanism at County, township and village levels and carry out the knowledge training of traditional farming knowledge, technique and folk culture on a regular basis	Culture Bureau	County financial	0.3	2015-2020
	Help public to learn more about, pay more attention to Ziquejie Terraces and be more willing to protect it though seminars, skills training, publicity pictures, literacy books, related legal Q &A, the local rules or regulations quizzes and a variety of other folk ways and means to strengthen the transmission and inheritance of traditional farming techniques and knowledge	Culture Bureau	County financial	0.2	2018-2025
Promoting the education of local traditional culture	Compile and write specialized teaching material about traditional farming culture in Ziquejie Terraces and to establish related teaching plan to actively carry out the agricultural heritage education for primary and middle school students of Ziquejie Terraces	Education Bureau	Central and county financial	1	2018-2025

**Table 3 Detailed actions for protecting agricultural landscape of Ziquejie Terraces**

Measures	Action Plan	Responsible Departments of Xinhua County	Source of Fund	Amount of Fund (million yuan)	Implementing Period
Protecting	Protect plants on the top of mountains and to strictly prohibit	Forestry Bureau	County financial	0.3	2015-2025



forest vegetation	deforestation				
	Implement the projects of afforestation to increase the forest coverage	Forestry Bureau	County financial	0.5	2015-2020
	Strengthen the special protection of ancient and famous trees and conduct labelling, recording and special care for them	Forestry Bureau	County financial	0.15	2015-2017
Protecting irrigation systems	Repair the seriously damages irrigation and water conservancy facilities and ridges	Water Conservancy Bureau	Provincial financial	0.7	2015-2020
	Set up stable special funds and engineering personnel team for water conservancy facilities maintenance	Water Conservancy Bureau	Provincial financial	0.75	2015-2020
	Systematically summarize the principles behind the natural gravity irrigation system and its scientific ways of water usage and management	Water Conservancy Bureau	County financial	0.05	2015-2020
	Conduct training, teaching and learning of young farmers and to restore the traditional water management personnel system	Water Conservancy Bureau	County financial	0.1	2018-2025
Protecting terrace landscapes	Accelerate the recovery of abandoned terraced fields by transferring lands or some incentive measures	Agriculture Bureau	Central and county financial	1.45	2018-2025
	Build a special ecological compensation mechanism for paddy fields in proposed sites and establish a special protection fund of terraces	Agriculture Bureau	County financial	0.42	2015-2020
	Establish a reward system with scientific standard and scope to encourage the traditional rice production	Agriculture Bureau	County financial	0.08	2015-2020
Protecting traditional villages	Set up a special fund for protecting traditional folk houses and speed up the repair and restoration of traditional folk houses in proposed sites	Housing and Construction Bureau	Central and county financial	1.8	2015-2020
	Focus on the key repair, maintenance and protective development of Zhenglong Village and Louxia Village	Culture Bureau	Central and county financial	2	2015-2020

	Strengthen the management of living environment and the road repair of rural villages and dispose the living garbage effectively	Environmental Protection Bureau	Central and county financial	1.1	2015-2025
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**Table 4 Detailed actions for developing eco-agricultural of Ziquejie Terraces**

Measures	Action Plan	Responsible Departments of Xinhua County	Source of Fund	Amount of Fund (million yuan)	Implementing Period
Surveying traditional crop varieties	Survey traditional varieties of rice and other crops	Agriculture Bureau Science & Technology Bureau	Provincial financial	0.5	2015-2017
	Construct germplasm repository	Agriculture Bureau Science & Technology Bureau	County financial	0.4	2018-2020
Popularizing traditional farming technology	Establish technical regulations for planting traditional rice, for example, improving the traditional grain drying methods based on strict hygienic conditions for the high value markets	Agriculture Bureau	County financial	0.1	2015-2017
	Promote the cultivation of traditional rice varieties in core area and guarantee that its area reach more than 50% in 2020	Agriculture Bureau	Central and county financial	5	2015-2020
	Promote traditional farming technologies and the compound farming model, such as duck farming and fish breeding in paddy fields	Agriculture Bureau	Provincial, county financial	1.8	2015-2025
	Try some small manual plough or harvest machines. If they can be easily used and no any damage to the agricultural system and environment, then they can be used in the whole proposed site	Agriculture Bureau	Provincial, county financial	0.5	2015-2025
Optimizing the layout of ecological	Layout traditional rice production in the core area	Agriculture Bureau Urban and Rural Planning Bureau	County financial	0.3	2015-2020

agriculture	Optimize the layout of high quality rice production base, high-quality tea plantation base, demonstration base of Chinese high-yield herbal medicine, small grains production base, duck, cattle and other ecological breeding and production base	Agriculture Bureau Urban and Rural Planning Bureau	Central, provincial and county financial	5	2015-2020
cultivating and certifying eco-products	Establish measures for using GIAHS or NIAHS signs	Agriculture Bureau	County financial	0.5	2015-2017
	Conduct certification of pollution-free agricultural products, green food and organic agricultural products and geographical indication product certification and to realize the area of green food production area accounts for 50% of the core area before 2017, and reach 80% before 2020	Related enterprises and farmers	Central, provincial and county financial	3	2015-2025
	Conduct international organic product certification	Related enterprises and farmers	County financial	0.4	2018-2025
Deep processing and developing agricultural products	Foster the agricultural products processing enterprises and increase their number to 12 before 2017, and to 16 by 2020	Agriculture Bureau	Central, provincial and county financial	2	2015-2020
	Develop functional foods and to improve scientific and technological innovation capacity of enterprises	Agriculture Bureau Related enterprises	Provincial and county financial	1	2018-2025
Promoting agriculture Product and brand building	Establish a display and sales platform for series of agricultural products in Ziquejie Terraces, such as, microblog and Wechat accounts will be set up to develop agricultural e-commerce	Agriculture Bureau	Provincial and county financial	1	2015-2020
	Select 3 to 5 cities annually for the promotion fairs of agricultural products from Xinhua County and to use media channels like television, newspapers, radio and other media channels to enhance publicity	Agriculture Bureau Commercial Bureau	Central, provincial and county financial	5	2015-2025
	Enhance brand creation and construction and provide relevant capital, technological and policy supports for agricultural enterprises	Agriculture Bureau Finance Bureau	Provincial and county financial	5	2018-2025

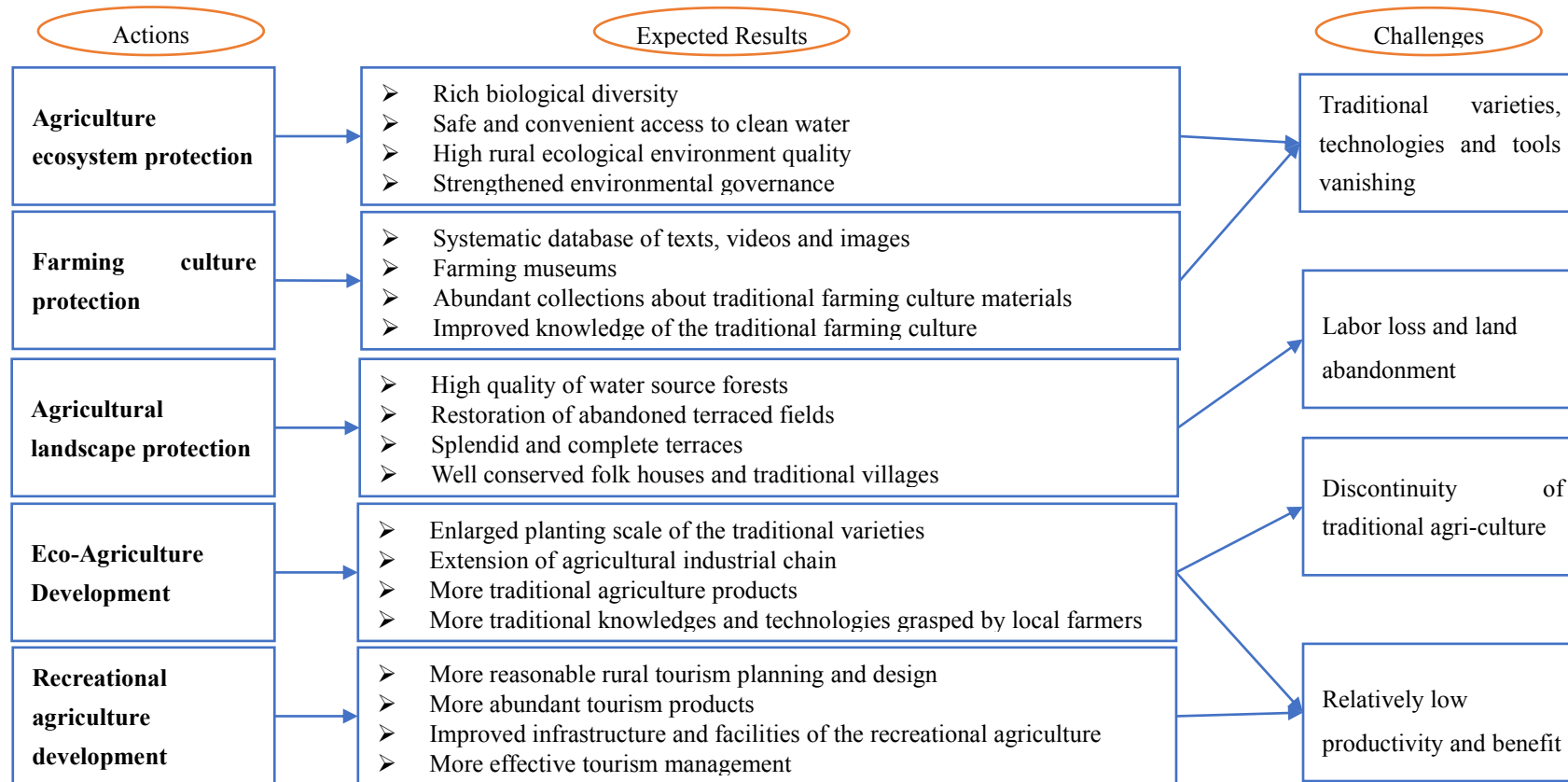
Cultivating new types of agricultural businesses of traditional agriculture products	Strengthen farmland transfer to develop large scale production households, family farms and cooperatives	Agriculture Bureau Finance Bureau	County financial	1.5	2015-2018
	Innovate traditional management mode of agricultural products, strengthen the cooperation of farmers, encourage enterprises to construct production base, set up the leading roles of enterprises and cooperatives to farmers, and establish the benefit sharing mechanism	Agriculture Bureau	Provincial and county financial	1	2018-2025

**Table 5 Detailed actions for developing eco-agricultural of Ziquejie Terraces**

Measures	Action Plan	Responsible Departments of Xinhua County	Source of Fund	Amount of Fund (million yuan)	Implementing Period
Designing recreational agriculture tour routes	Construct the optimized layout of recreational agriculture in Xinhua County	Tourism Bureau	Central and provincial financial	300	2015-2020
	Form a set of recreational agriculture development systems integrating agricultural production, cultural experiences, ecological protection, product processing and leisure recreation	Tourism Bureau	County financial	10	2015-2025
Designing and producing more recreational agriculture products	Optimize the layout of recreational agriculture and focus on the construction of ecological agriculture demonstration area, rice culture demonstration area, the recreational demonstration area and creative agriculture park	Tourism Bureau	Central, provincial and county financial	200	2015-2020
	Use modern science and technology to display the long farming culture, farming technology, folk culture, etc.	Tourism Bureau	County financial	10	2018-2025
	Design related tourist souvenirs from the aspects of antique art, folk custom products and agricultural products	Tourism Bureau and related enterprises	Company investment	10	2015-2025

	Design tourism themes in different seasons, such as sightseeing, picking, and festival participation	Tourism Bureau	Company investment	5	2015-2020
	Set up sales sites of agricultural products of the proposed sites with unified logo	Tourism Bureau	Central, provincial and county financial	10	2015-2020
Optimizing recreational agriculture infrastructure	Strengthen the construction of roads and improve the road network	Tourism Bureau	Central, provincial and county financial	150	2015-2020
	Improve sanitation facilities through the rational design of the public toilets and the construction of some toilet for the disabled people and setting of dump and garbage collection site	Tourism Bureau	Central, provincial and county financial	20	2015-2020
	Strengthen the construction of tourist service center and tourism information service	Tourism Bureau	Company investment	40	2018-2025
	Design leisure agriculture culture identification system and upgrade existing hotels and restaurants so as to improve tourist reception capacity	Tourism Bureau	Company investment	40	2015-2020
Improving management mechanism of recreational agriculture	Optimize the government functions and clarify the orientation and functions of related governmental departments	Tourism Bureau	County financial	0.2	2015-2020
	Distribute tourism revenue in a reasonable way, and make sure local farmers are the main beneficiaries.	Tourism Bureau	County financial	0.5	2015-2020
	Guide the development of tourism enterprises and give preferential measures in the capital, talent, market, policy, etc. to improve the management level and management ability of tourism enterprises	Tourism Bureau and related enterprises	Provincial and county financial	2	2015-2025

## 2.2 Responses of activities to the challenges



**Figure 1** How expected results of action plan response to challenges



## **2.3 Fund raising for activities**

In order to get sufficient funds to promote the protection and development of Ziquejie Terraces, the government will establish multi-channel modes of financing to find funds by all means, and establish Agricultural Heritage Protection Fund as a special fund at the same time.

There are different ways to raise funds as following:

(1) International funds. The proposed site can make use of the international assistant by applying for special funds from GEF through FAO or applying for financial supports from other relevant international organizations to promote the protection and development of the proposed site;

(2) National funds. The proposed site can make good use of relevant national policies to raise funds. For example, with the protection of traditional ancient villages policy, the proposed site can actively seek funds from related sectors and departments to repair the traditional ancient villages; with the beautiful countryside construction and new rural construction policy, the proposed site can actively seek funds from related sectors and departments to improve the living environment in rural areas; The proposed site can also apply for the national poverty alleviation and development funds to guarantee the right of the poor farmers to have a better life.

(3) Local government funds. The proposed site can also ask for help of the local government. For example, they may apply government financial subsidies and incentives to encourage the development of organic, environment-friendly products in the proposed site.

(4) Social Fund. The proposed site can raise funds from other stakeholders. For example, to encourage the companies and individuals benefited from the GIAHS to take a portion of their funds and directly invest in heritage protection.

## **2.4 Institutional involvement and embeddedness**

The organization system construction is very important to guarantee that the manager of the proposed site has clear thought and plan about its protection and development, and guide management persons at different level systematically. The government should fully consider the opinions of farmers of the proposed site in the policy-making process of related regulation and policy and to conduct dynamic adjustments according to the actual situation of farmers and communities.

At national central government level, the Department of International Cooperation, Ministry of Agriculture, PR China has a division to take charge of the application, evaluation, supervision, and other administration of GIAHS with a scientific committee consisting of 25 scientists from different background. the Bureau of Township Enterprises, Ministry of Agriculture, PR China has a division to take charge of the application, evaluation, supervision, and other administration of China-NIAHS with a scientific committee consisting of 27 scientists from different background. A special fund was set up by MoA of China to support the protection of proposed site.

At local government level, in order to ensure the success protection and development of Ziquejie terraces, a leading group of Ziquejie Terraces has been established with the county mayor as the group leader and the vice county mayors in charge of agriculture and culture respectively as the supporting leaders; members of the working group include personnel from Finance, Agriculture, Culture, Planning and Construction departments of Xinhua County, and also the responsible persons of relevant

townships in the core area of proposed proposed site. Regular meetings will be held with the participation of relevant personnel of agricultural heritage management of Ziquejie Terraces. Works and progress as well as future work arrangements of participating personnel will be informed respectively during the meeting. Problems existed in the previous work will also be raised for group discussion with the aim to find out solutions. The collaboration mechanism among Hakka Terraces, Longji Terraces, Ziquejie Terraces, and Lianhe Terraces will be set up. The Coordination Committee of Protection and Management of Rice Terraces System in Southern Mountainous and Hilly Areas in China will be established. They will organize exchange activities periodically.

At the village level, farmers are the key players in the agricultural heritage protection work. Therefore in order to successfully carry out agricultural heritage protection, a protection mechanism aims to protect the rights and interests of farmers must be set up. Construction of self-management system in community shall be strengthened and the village committee participated by the villagers, village enterprises and villager's committee shall be set up for self-government. Measures shall be taken to enhance farmers' awareness and active participation concerning the protection of agriculture heritage. Awareness of the villagers shall be constantly improved to safeguard the success implementation of actions about the protection and development of Ziquejie terraces.

# **Annex 8 Dynamic conservation plan for Youxi Lianhe Terraces**

## **1. A baseline description of activities, policies and experiences**

### **1.1 Construction of System and Mechanism**

A leading group for application for GIAHS has been established. The Party Committee and the government of Youxi County established a leading group for application for GIAHS, and set a specialized office. The Secretary of the Party Committee served as the group leader, responsible for the publicity, organization and promotion work in respect of the application and protection of Youxi Lianhe Terraces. In addition, the group leader also takes an active part in relevant agricultural heritage exchange activities and training classes, and vigorously promotes and popularizes Lianhe terraces by internet, radio and other media.

### **1.2 Funding Project Inputs**

Formulating government subsidy system boosts the traditional agricultural production in terraces. Since 2012, in order to encourage local residents to carry out agricultural production and attract young adults to come back the Lianhe Township Government has provided subsidies for agricultural producers, in accordance with the standard of 22,500 yuan for each hectare. To encourage the reclamation of deserted terraces, it has subsidized 15,000 yuan for each hectare of reclaimed deserted terraces in past 3 years, and 30,000 yuan for each hectare of reclaimed terraces that have been deserted for a long time. Land reuse was by the farmer cooperatives to carry out land circulation, to solve the problem of abandonment.

Signing Agreements with Farmers Propels the Protection of Agricultural Crop Varieties. By consulting with the farmer households of Dongbian Village of Lianhe Township, the township government signed the Agreement on Cultivating Conventional Paddy Rice and Dry Field Crops with them, requiring cultivating 16 varieties of rice in the paddies and 5 varieties of Dongbian Village (Lindou District). Compared with the modern species, local rice varieties yield is low, disease resistance, cold resistance and drought resistance are common, however, red shell surgery taste better, better to make wine, other species are taste common, but its nutrient value is higher. Moreover, in order to protect the traditional rice varieties, the germplasm resources of the local breeds are established in the Dongbian village of Youxi Lianhe terrace, with an area of about 0.65 ha. In addition, the traditional black rice and red rice varieties are planted in the whole terrace, and the area is about one tenth of the total area.

Boosting the status survey and scientific research were conducted for Lianhe Terrace Heritage. Experts of Fujian Academy of Agricultural Sciences, Fujian Agriculture and Forestry University and Fujian Normal University carry out a long-term research and experiment of rice breeding, composite agricultural production and ratooning rice cultivation by taking the Lianhe Terrace of Youxi County, Fujian Province as their research

base. Their work lays a significant scientific foundation for the protection of Lianhe Terrace Agricultural Culture Heritage and the industrial development, and improves the scientific supporting ability of the Lianhe Terrace Agricultural Culture Heritage. Moreover, better management the pests and diseases, expert need further study the effect of intercropping patterns of the use of biotechnology, and the physical methods to control pests and diseases to ensure terrestrial soil safety.

### **1.3 Ecological Product Development and Brand Building**

From 2010 to 2015, 32 enterprises including 121 products won the “Three-Product” Certification. Thereinto, 14 enterprises were certified with 19 pollution-free agricultural products, the certified area of 35,900 mu and output of 15,800 tons; 15 enterprises were certified with 25 green food products, the certified area of 10,300 mu and output of 13,400 tons; 3 enterprises were certified with 77 organic food products, the certified area of 380.2 ha and output of 286.8 ha. Spot check was irregularly conducted for supermarket, farmer’s market and vegetable fields. Some manufacturing enterprises, farmers’ professional cooperatives and main bases were equipped with rapid pesticide residue detector and self-disciplined detection was carried out for agricultural products.

### **1.4 Sustainable Tourism Development**

Since 2010, the Youxi County Government has made a tourism development plan and an overall plan for tourism areas, and has planned the terrace of Lianhe Township as the major area. The plan covers the ancient terrace and ancient temples of five areas in Lianhe Township, laying an important foundation for developing tourism and protecting terrace. According to the Lianhe terrace tourism statistics, the number of tourists is about 120,000 in 2015, in the tourist season, the government control the tourist number to ensure the safety of terrace, therefore, tourism will not damage the terrace system and culture. Moreover, the construction of the public facilities such as the Lianhe terrace road, the walkway, the canal, the public toilets and the viewing platform are built though the support of the government funds.

### **1.5 Propaganda and Popularization**

In 2014 and 2015, Youxi invited CCTV-7 twice for field filming of the documentary video “Important Chinese Agricultural Heritage – Lianhe Terraces” and the promotion videos for application for GIAHS so as to further raise the popularity of terraces.

The county established 12316 Three-Rural Comprehensive Information Service Platform, developed a modern information channel to serve the “Three-Rural” and established an internet website with dedicated IP ([www.yxny155.net](http://www.yxny155.net)). There are 251 village jointly-running points and 152 rural information staffs, forming a “trinity” service mode of 12316 Agricultural Service Hotline. Farmers can get video consultation, agricultural training, information service, application service and expert guidance through free hotline, touch self-service terminal, PC self-service terminal and expert terminal and Mobile-phone Agriculture Service will offer. It’s aimed at improving farmers’ value consciousness for agricultural cultures, the awareness of carrying out organic production and the capability of industrial development in the way of agricultural informatization.

## **2. Activities for dynamic conservation of Youxi Lianhe Terraces and their expected results, fund raising and institutional involvement**

### **2.1 Activities for dynamic conservation**

#### **2.1.1 Comprehensive activities**

For protecting Lianhe Terraces, a series of activities will be implemented as follows:

##### **a. Media publicity**

Media publicity aims at improving the cognition of the local people to Lianhe Terraces and letting them know Lianhe Terraces are China-NIAHS and GIAHS. In detail, at least 3 million *yuan* will be budgeted per year from 2017 to 2025 for propagandizing widely how to use diverse-value of Lianhe Terraces for developing tourism and ecological agricultural products and how to protect agricultural eco-environment, traditional rice varieties and traditional agri-culture. The fund is mainly from the county government finance. The approaches include diverse level of TV, internet, radio, newspaper, etc.

##### **b. building a mechanism of experience exchange between the four terraces**

To establish a non-governmental organization is for propelling experience exchange between the four terraces and commonly applying projects. At least one meeting is opened each year for discussing countermeasures to the problems about protection of terraces and sharing the positive experiences of terraced protection. To visit the fields each other between the four places will be conducted for several times each year in an unstable date.

##### **c. strengthening the technology train for farmers**

A train mechanism at regular intervals is set up for improving farmers' modern agricultural technologies and some traditional agricultural technologies, for example, traditional methods killing weeds and pests, etc. at the same time, the methods drying and conserving products according to hygienic standards. These trains will be conducted twice a year in spring and winter from 2018 to 2025.

##### **d. making a mechanism of sharing benefits**

From 2018 to 2025, a series of sharing mechanism will be built for promoting farmers to participate in terrace protection. Firstly, building a sharing mechanism between farmers, tourism enterprise and enterprise; secondly, building benefit share from a GIAHS and China-NIAHS brand; thirdly, building benefit from green and organic products between farmers and enterprises.

#### **2.1.2 Activities just for each aspect**

Lianhe Terraces are a compound system, thus the conservation for them refer to at least three aspects which are agricultural ecological system, farming culture, agricultural landscape. Conservation for Lianhe Terraces will be implemented in five protective measures including agricultural ecological protection, farming culture protection, agricultural landscape protection, development of ecological products and ecological tourism development. And then all of them are divided again for 45 detailed measures. Each measure is introduced in the action plan, the responsible department, the implementation mode, the beneficiary, the financial source, and the duration of implementation (See the Table 1).

**Table 1 Detailed action plan for conservation of Youxi Lianhe Terraces**

Category	Plan of action	Responsible department	Implementation mode	Beneficiary	Number of funds (ten thousand)	Financial source	Duration of implementation
Agricultural ecological protection	To strengthen studies on eco-environmental problems in the proposed site and to protect rare plant resources	Agricultural Bureau, Bureau of Finance, and Environmental Protection Agency	Relying on the protection of the village committee	Farmers, government	75	County, township finance	2017-2025
	Governance to the environment of villages in the conservation area. In detail, building a rural-level hygiene management system and waste recycle bin and innocent waste disposal equipment.	Village Committee, Environmental Protection Agency and Agricultural Bureau	Hire a hygiene cleaner, purchase equipment	Farmers, government	270	County, township finance	2017-2018
	To build and protect the forest for conservation of water supply	Forestry Bureau and Land and Resources Bureau	Into the ecological public welfare and water conservation forest	Farmers, government	45	County, township finance	2019-2020
	To develop ecological agriculture and enhance the level of clean production	Agricultural Bureau, Bureau of Light Industry and Bureau of Animal Husbandry	Relying on the implementation of cooperatives	Farmers, government	70	County, township finance	2019-2025
	To encourage farmers to protect traditional crops resources	Agricultural Bureau and Bureau of Finance	Relying on cooperatives, the establishment of germplasm resources	Farmers, government	20	County, township finance	2017-2025
Farming culture protection	To collect and compile local folk songs, ballads and farming proverbs and cultural relics relating to agriculture	Bureau of Culture and Broadcasting, Television, Press and Publication	Commissioned county cultural station	Farmers, government	6	County, township finance	2017-2018
	To compile traditional culture books about Youxi for primary and secondary school students	Education Bureau and Bureau of Culture and Broadcasting, Television, Press and Publication	Commissioned center primary school	Farmers, government	5	County, township finance	2017-2018
	To open traditional culture course	Education Bureau	Commissioned center primary school	Farmers, government	2	County, township finance	2019-2025
	To hold Fuhu Festival and Rice Transplanting Festival	Tourist Administration and Lianhe Township	Commissioned Fu Hu cliff Management Committee	Farmers, government	140	County, township finance	2019-2025
	To affirm inheritor of traditional handicraft	Education Bureau and Bureau of Culture and Broadcasting, Television, Press and Publication and Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	5	County, township finance	2019-2020



Agricultural landscape protection	Strengthen supervision over land utilization	Land and Resources Bureau	Relying on the village committee	Farmers, government	100	County, township finance	2017-2025
	Design landscape of farmland	Tourist Administration	Commissioned by the qualification design unit	Farmers, government	45	County, township finance	2017-2025
	Terraces surveying and mapping	Land and Resources Bureau	Commissioned by the qualification design unit	Farmers, government	30	County, township finance	2017-2018
	Supervision over terraces and scenic spots	Township Government and Tourist Administration Forestry Bureau	Commissioned by the qualification design unit	Farmers, government	5	County, township finance	2017-2025
	To use small farming machines in practicable farmland	Agricultural Bureau and Bureau of Finance	Through media publicity and financial subsidy	Farmers, government	30	County, township finance	2018-2025
	Road pavement of scenic spot	Bureau of Housing and Urban-Rural Development and Department of Transportation	Relying on terraced fields of agricultural culture development Limited	Farmers, government	2500	County and township finance and social capital	2017-2025
	To make subsidy policy to promote the land transfer for appropriate operation.	Agricultural Bureau and Bureau of Finance	Give subsidy to the households renting in farmland.	Farmers, government	200	County finance	2017-2019
Development of ecological products	Trademark registration of “Lianhe Terrace”	Agricultural Bureau	Relying on terraced fields of agricultural culture development Limited	Farmers, government	20	County, township finance	2017-2019
	Certification of “Three Grades” including pollution-free agricultural products, green products and organic products	Environmental Protection Agency and Agricultural Bureau	Commissioned rural agricultural technical station	Farmers, government	30	County, township finance	2017-2025
	Production of edible mushrooms. Go on promoting more kind of edible mushrooms produced by straw.	Agricultural Bureau	Commissioned rural agricultural technical station	Farmers, government	10	County, township finance	2017-2025
	Promoteing development of product processing, like bamboo and wood crafts, urther processing of grain and oil, fungus processing	Forestry Bureau	Relying on terraced fields of agricultural culture development Limited	Farmers, government	30	County and township finance and social capital	2017-2025
	Establish the “platform for quality safety traceability and supervision of agricultural products”.	Bureau of Quality Supervision	Relying on rural agricultural technical station	Farmers, government	20	County, township finance	2017-2025

Ecological tourism development	To make a tourism planning for spatial arrangement according to the themes of agricultural heritage tourism.	Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	25	County, township finance	2017-2020
	To conform the daily number of tourist reception and establish a system for monitoring the number of tourist.	Tourist Administration	Relying on rural tourism office	Farmers, government	5	County, township finance	2017-2020
	To establishing experience center of terrace, small museum of proposed site culture and visitor center	Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	430	County, township finance	2017-2020
	To build exhibition area for recovering the varieties of traditional agricultural products, and traditional planting ways in rice paddy and making environment improvement at the same time.	Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	5	County, township finance	2017-2020
	Establishing photography base for terrace farming culture and landscape.	Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	50	County, township finance	2017-2020
	To set up several viewing decks along the travelling route of terrace. 3 of which are located at Dongbian Village; 3 are located at Yunshan Village, 2 are located at Xiayun Village and 3 are located at Lianyun Village.	Tourist Administration	Relying on terraced fields of agricultural culture development Limited	Farmers, government	880	County and township finance and social capital	2017-2020
	To apply for demonstration spot of leisure agriculture to Ministry of Agriculture.	Agricultural Bureau	Relying on terraced fields of agricultural culture development Limited	Farmers, government	5	County, township finance	2018-2020
	To construct a large terrace tourism resort of 2 km <sup>2</sup> at the dairy farm at Dongbian Village.	Tourist Administration and Bureau of Housing and Urban-Rural Development	Relying on terraced fields of agricultural culture development Limited	Farmers, government	2000	County and township finance and social capital	2018-2020
	To construct facilities include a tourist information center on the foundation of farm house at Lianyun Village and build up roads.	Tourist Administration and Bureau of Housing and Urban-Rural Development	Relying on terraced fields of agricultural culture development Limited	Farmers, government	20	County, township finance	2017-2020
	To develop tourism products depending on agriculture and forestry products.	Tourist Administration and Agricultural Bureau	Relying on terraced fields of agricultural culture development Limited	Farmers, government	30	County, township finance	2017-2020

## 2.2 Expected results of activities

**Table 2 Expected results of activities and response of the challenges**

Countermeasures (See table 1)	expected effect		challenge
Agricultural ecological protection	<ul style="list-style-type: none"> <li>✓ Causes of ecological and environment problem will be examined</li> <li>✓ The ecological and environmental deterioration will be restrained and environment of villages and farmland will get obvious improvement.</li> <li>✓ The the agricultural eco-system quality will be improved</li> <li>✓ Rare rice varieties will be protected effectively.</li> </ul>	→	<ul style="list-style-type: none"> <li>✓ high-yield hybrid rice with high chemical fertilizers and pesticides is expanding</li> </ul>
Farming culture protection	<ul style="list-style-type: none"> <li>✓ The local farming cultures will be written by words and pictures</li> <li>✓ The primary and secondary school students will master the essence of Youxi agro-farming culture little by little</li> <li>✓ The young will have the awareness and sense of pride of protecting their own agro-farming culture through five years' effort.</li> </ul>	→	<ul style="list-style-type: none"> <li>✓ The crisis of cultural fault occurs in the young generation makes traditional agro-farming culture faces absence of inheritance</li> </ul>
Agricultural landscape protection	<ul style="list-style-type: none"> <li>✓ The traditional agricultural planting patterns will be recovered and maintained effectively</li> <li>✓ The dimensional terraced landscapes are in good codition.</li> <li>✓ All the abandoned farmland will be cultivated</li> </ul>	→	<ul style="list-style-type: none"> <li>✓ Decrease of the water resource management ability of farmers and disuse of many mountain spring mouths have led to lackage of water source for terraced agriculture.</li> </ul>
Development of ecological products	<ul style="list-style-type: none"> <li>✓ Ecological agriculture of terrace will be fast developed and will make Youxi's safe agricultural products the national well-known brand within 5 years</li> <li>✓ 60% of organic and green rice got certificated; all types of soybeans and peanuts got certificated; 60% of domestic animals, poultry and fishery products got certificated.</li> </ul>	→	<ul style="list-style-type: none"> <li>✓ Diversity of livelihood makes loss of young labor for terraced fields</li> </ul>
Ecological tourism development	<ul style="list-style-type: none"> <li>✓ Tourism will become a important income sources for local farmers.</li> <li>✓ The kind of tourism products will increase obviously</li> <li>✓ The agricultural income will rise on account of the tourism development.</li> <li>✓ Lianhe terraces will absorb more local people to employ and the number of farmers outmigrating will decrease</li> </ul>	→	

## **2.3 Fund raising for activities**

The protection given to agricultural heritage needs financial support. The government and people of the proposed site should set up multiple channels to raise fund, so as to guarantee the progress of the cultural heritage protection work. The main ways of financing are as follows:

(1) International donation: Make use of the brand of heritage and extensive publicity to enhance the overseas compatriots' affection to their hometown and investment willingness for raising offshore funds.

(2) Corporate financing: Invite investment for the landscape and culture that have significant value of tourism development and traditional food and products that have economic value.

(3) Special fund: Apply for special fund for protection to international monetary fund and national departments related to agriculture, tourism, national territory and housing and urban-rural development.

(4) Apply for development according to the national strategic plan: Get the support of national funds by taking advantage of the strategic plan of "One Belt and One Road" and setting up agricultural-heritage-related projects.

(5) Support from policies for old revolutionary base area: Youxi is an old revolutionary base area, which could get the financial support through the preferential support policies of the State for old revolutionary base areas.

(6) Scientific research: Cooperate with research institutes to take the Lianhe Terraces of Youxi as research object to apply for national scientific research project and get financial support.

(7) Combine with the project relating to construction of beautiful village: The State requires the governments at all levels to provide special funds for construction of beautiful village, so the agricultural heritage protection could make full use of such fund to reinforce the heritage protection whilst promoting rural construction.

## **2.4 Institutional involvement and embeddedness**

### **2.4.1 National Organization**

Bureau of Township Enterprises of Ministry of Agriculture of the PRC and the Department of International Cooperation have specially set up a division to take charge of the application and evaluation and supervision and administration of China-NIAHS and GIAHS and established a special fund to support the work of agricultural heritage protection. They also set up two committees of experts consisting of 27 members in total as technical support. The Ministry of Agriculture and Ministry of Science and Technology also give full attention and support to the application for world heritage of Terraced Field at Lianhe Township, Youxi County. The State will also continue to strengthen the building of department for macro organization, control and management of agriculture heritage, guide and publicize agricultural heritage protection and make the work carried out smoothly.

### **2.4.2 County-Township-Village-Level Organization**

Strengthen the building of county-township-village-level organization and work together to establish the committee of agricultural heritage protection, which mainly consists of the secretary and deputy secretary of county CPC committee and leadership from the agricultural bureau, tourist

administration and the governments of all townships, to ensure the smooth implementation of program of agricultural heritage protection and take charge of the management and implementation of international and national projects. The proposed committee shall have the executive office, which takes charge of the execution of missions of the committee with full authority. The office should be seated in the county agricultural bureau for the convenience of implementation of work. The district and township government should establish corresponding divisions to cooperate with their work.

#### **2.4.3 Building of Local Community Organization**

Establish village committee that is governed by the villagers in the community to increase the community residents' understanding to protection work and their participation enthusiasm and achieve community co-management, making the agricultural heritage protection carried out smoothly in the concrete process of implementation; establish farmer-enterprise cooperation council to provide a platform for communication and cooperation talk on cooperation between the farmers and enterprises and, promote their cooperation for the purpose of protecting agricultural heritage via development and utilization of resources.

## Annex 9 Comparison with Hani Rice Terraces and Ifugao Rice Terraces

Characteristics		Rice Terraces in Southern Mountainous and Hilly Areas, China				Honghe Hani Rice Terraces	Ifugao Rice Terraces
		Chongyi Hakka Terraces	Longsheng Longji Terraces	Xinhua Ziquejie Terraces	Youxi Lianhe Terraces		
<b>Summary Information</b>	Location	They are located at the latitude between 25° and 28°N.				22°26'~23°27'N	17°20'N
		Chongyi County, Ganzhou City, Jiangxi Province, China	Longsheng County, Guangxi Zhuang Autonomous Region, China	Xinhua County, Hunan Province, China	Youxi County, Sanming City, Fujian Province, China	Yuanyang County, Honghe County, Lvchun County and Jinping County in Yunnan Province, China	Gran Cordillera Central mountain range of northern Luzon Island, Ifugao Province, Philippines
	Area	The area of the proposed site is 521.15 km <sup>2</sup>	The area of the proposed site is 237.3 km <sup>2</sup>	The area of the proposed site is 460 km <sup>2</sup> .	The area of the proposed site is 103.1 km <sup>2</sup> .	11020 km <sup>2</sup> The terraced field located in Honghe, Yuanyang, Jinping and Lvchun County, totally reaches 54667 ha.	2518 km <sup>2</sup> The area of the famous Banaue Rice Terraces is about 40000 ha.
	Climate	They are influenced by the subtropical monsoon climate (to be specific, southeast monsoon). Dry and wet season is not clear. The annual precipitation is about 1600 mm				Subtropical monsoon climate (southwest monsoon). Dry and wet season is clear. The annual precipitation is about 945.3 in Yuanyang County.	Tropical oceanic climate. The annual precipitation is about 3530mm, which makes the Ifugao as one of the moistest regions of planting rice in the world.
	Topography	They are located in the third step of China's terrain. The topography is featured with middle/low mountains and hills which cover more than 70% of the total area of the proposed site.				Int the second step of China's terrain. Mountain covers more than 95%.	The heritage system is on the mountain.
280-1860m		300-1916m	353-1584m	100-900m	680-2000m	700-1600m	

Characteristics		Rice Terraces in Southern Mountainous and Hilly Areas, China				Honghe Hani Rice Terraces	Ifugao Rice Terraces
		Chongyi Hakka Terraces	Longsheng Longji Terraces	Xinhua Ziquejie Terraces	Youxi Lianhe Terraces		
	Agro-Ecological Zone	Mountainous and hilly areas for forestry and agriculture in the middle and low reaches of Yangtze River of China				Forestry and agriculture area in Southern Yunnan China	-
	History	<p>The people who constructed these terraces migrated from the Center Plain of China in the history. Lianhe and Hakka Terraces were developed on the path from Center Plain to Jiangsu and Zhejiang first, then to Fujian and then to Jiangxi and Guangdong. Ziquejie and Longji Terraces were probably developed on the path from Center Plain to Hunan and then to Guangxi.</p> <p>The history of Hakka Terraces is more than 800 years long, that of Longji Terraces and Ziquejie Terraces is more than 1000 years long and that of Lianhe Terraces is over 1300 years long.</p>				<p>Hani minorities are the descendants of Qiang people from the Qinghai-Tibet Plateau.</p> <p>The terraces have a history over 1300 years.</p>	<p>The original plants in the terraces were some other crops.</p> <p>Rice was planted from 500-600 years ago.</p>
	Ethnicity	Han people (the Hakka) accounts for more than 99% of the total population while the minority (mainly She people) accounts for less than 1%.	They are in a multi-national region, with the Zhuang and Yao people as the majorities while Han, Miao and Dong people as the minorities.	They were once occupied by multi-ethnics including Yao, Miao, Dong and other people in the history. Nowadays, they are dominated by Han people.	The Han people occupy over 99% of the population while the minority is mainly She people.	Hani, Yi, Yao, Han and other ethnic groups	Ifugao people
<b>Food and livelihood security</b>	Rice	Rice is the most important food for the local people.				The total area of rice cultivation accounts for 44.2% of total cultivated land area. The yield of rice accounts for 46.9% of total grain yield.	The terraces produce only half as much food as the local community.
	Featured products	Tea, bamboo, navel oranges	Longji peppers, tea, Mahogany fruit	Chinese herbal medicines, Finger Millet.	Beans on the ridge of terraced fields, vegetables	Rubber, palm, sugar cane, cassava, banana, <i>etc.</i>	Pea, grass, mango and rubiaceae, <i>etc.</i>



Characteristics		Rice Terraces in Southern Mountainous and Hilly Areas, China				Honghe Hani Rice Terraces	Ifugao Rice Terraces	
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	Main source of livelihood	Terraces provide most of the food for the local people and lay the foundation for a variety of activities. Agriculture is an important source of household incomes. Agriculture contributes about 20% to the local GDP, higher than the average of the country (10%).				Agriculture accounts for about 30% of GDP.	Agricultural production is an important source of income for farmers.	
<b>Biodiversity and ecosystem function</b>	Traditional rice varieties	An abundance of traditional rice varieties have been conserved in these terraces, which are adapted to the local environment.					The system retains at least 56 of traditional rice varieties. The traditional red rice is well kept in the upper part of the mountain. Some other spices, which are advantageous to the rice terraces, are kept in different areas. Multiple rice species are intercropped in order to improve the resistance of the paddy ecosystem.	One of the <i>Oryza Sativa</i> “Bulu” grows in this area. Small amount of Tinawon, as a local specialty, is still planted. Hybrid rice is the main part of paddy. Some 561 rice varieties native to Ifugao are collected and conserved in IRRI’s gene bank for research purposes.
		There are 13 traditional rice varieties, of which important ones are <i>Oryza sativa</i> ‘dahezi rice’, <i>Oryza sativa</i> ‘yellow husk glutinous rice’, <i>Oryza sativa</i> ‘black rice’, <i>Oryza sativa</i> ‘pearl short rice’, <i>Oryza sativa</i> ‘Mazhan glutinous rice’, <i>Oryza sativa</i> ‘sorghum glutinous rice’, <i>Oryza sativa</i> .	There are 7 traditional rice varieties, of which important ones are Tonghe Rice, Longji Fragrant Glutinous Rice and Diling Red Sticky Rice	There are 8 traditional rice varieties, of which the black tribute rice and red rice are two most distinctive and popular varieties.	There are 72 varieties of traditional rice, of which important ones are garnet, Youxi red, cold waterdrop, huzao, dwarf white, etc.			
	Local agricultural species/varieties	There are 26 local crop varieties, like indica yellow millet, chicken feet millet, dog tail millet, china grass, yellow millet, Jute, konjak, bottle gourd, yam beam, bitter tea and sweet tea.	There are some important local agricultural species, including Longji peppers, Longji tea, Mahogany fruit; Corn Sweet potato	There are 10 local crop varieties, including finger millet, foxtail millet, Tartary buckwheat, soybean, black bean, rice bean, mung bean, broad bean, Potato, and peanut.	There are 27 species of food grains, 21 species of oil-bearing crops, 44 species of vegetables, of which sweet potatoes, peanut, soybean, leaf mustard are full of local characteristics.	There are 28 species of food grains, 32 species of vegetables, and 13 species of spice, of which the red rice, konjac, mushrooms, beans are full of local characteristics.	-	

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	Protected plants and animals	Due to different climate types, topographic locations and agro-ecological zones, these rice terraces have formed distinctive plant and animal resources.					
		Three species are under Level-I National Key Protected Wild Plants, and fourteen species are under Level-II National Key Protected Wild Plants	There are 2 national first-class protected tree species and 6 national second-class protected tree species	Five plant species belong to class I national protected plants; eleven species belongs to class II national protected plants,	2 species of the first class national protected plants; 7 species of second class national protected plants	-	-
	Six species are under Level-I National Key Protected Wild animals, and 50 species are under Level-II National Key Protected Wild animals	There are 2 Species of National First Class Protected Animals and 29 Species of National Second Class Protected Animals	Two animal species belong to class I national protected animals; thirteen animal species belongs to class II national protected animals.	5 species of first class national protected animals; 12 species of second class national protected animals	-	-	
	Ecosystem function	These terraces have important ecological functions, include water and soil conservation, climate and gas regulation, air and water purification, etc.					
<b>Knowledge systems and adapted technologies</b>	Terraces construction and maintenance	Most of them started with “slash and burn” to make original forest change into dryland. Then measures were taken to transform the dryland into tableland and gradually turn them into cultivated lands. The third step is to transform the tableland into terraced fields gradually by building a complex ditch system for irrigation and drainage.				A terrace was formed by cutting on the sloping land, and making the weir by the barrier mud. Accordingly, the height of most rand is not big, basically in two meters or so.	The cofferdam wall of terrace is built on rock by manpower in order to prevent soil erosion. The maximum of the weir is about 4 meters. In this rand, it must be paved a hard soil to avoid the soil erosion.
		Ridge is made of soil	Ridge is made of soil and stone.	Ridge is made of soil	Ridge is made of soil and stone	Made of soil	Piled up by stone

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		Ploughing and reinforcing the ridge in spring; planting soybean on the ridge edge of paddy fields, which is commonly known as "Tiangeng beans".	Repairing ridge is usually conducted before spring ploughing between March and April every year. The method is to cover with mud to reinforce ridges by hand and reinforce bund by feet.	Local farmers generally plow and plough the terraced fields in autumn and winter, and they also plough and level the terraced fields for 2-3 more times before planting rice in spring. To ensure the stability of the terraces, there is an important part of the soil preparation process called "paste ridges", i.e. to clean up weeds and repair the ridges.	Ploughing fields and repairing ridges in spring; planting soybeans on field ridges.	After the fall harvest, Hani people repair the rand of terraces. A kind of beans is planted on the rand.	After the fall harvest, Ifugao people repair the stone wall of rand.
		Previously, farmers stored water in most fields to protect the ridge from collapsing in winter, but nowadays few of them do this.	In order to prevent the terraces from cracking, irrigation must be stopped in winter.	After the harvest of mature rice in fall every year, 80% of the paddy fields are irrigated and soaked in water till the spring of the coming year,	Not store water in paddy fields in winter	Farmers stored water in the terraces.	There is no water in the terraces in winter.
Production knowledge and		An abundance of traditional knowledge and technologies have been conserved during the process of agricultural production.					
		Part of field rotate after rice harvesting	About 20% of the total area are cultivated with rapeseed	After rice is harvested, 20% of the area is rotated to plant	Crop rotation is widespread between rice and other	No crop rotation in the paddy field	No crop rotation in the paddy field

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technologies			in winter while the remaining 80% are barren land for grass to maintain the land fertile after rice harvesting..	other crops.	crops.		
	Intercropping is common in these terraces.						
	Raise fish and duck in terraces	Raise duck in terraces	Raise fish and duck in terraces	Raise fish and duck in terraces	Raise fish, ducks and other aquatic organism in terraces.	Raise fish, ducks and other aquatic organism in terraces.	
	-	Manual ploughing in pairs	-	-	-	-	
<b>Cultures, value systems and social organizations</b>	Festivals and customs	Traditional festivals include Dragon Boat Festival, Tomb Sweeping Festival, Ghost Festival, Mid-Autumn Day, Winter Solstice and Spring Festival	Hanging Clothes Festival; Clay Cattle Festival; Torch Festival; Plowing Festival; Seedling Trimming Festival; Folk Song Festival	Eating Glutinous Rice Cake on Spring Sacrifice Day; Celebrating the Birthday of Cattle on April 8th of Lunar Calendar; Tasting the newly harvested rice. On June 6th of lunar calendar	Festivals and customs closely relate to agriculture, which usually refer to praying bumper and no disasters.	The traditional festivals of Hani people include <i>Zhalete</i> , <i>Angmatu</i> , <i>Kangepo</i> , <i>Moangna</i> , <i>Hezhazha</i> , <i>Cheshizha</i> , etc.	During the season of planting, local people hold a grand festival to pray for a bumper harvest.
	Folk arts	Zhudong folk song, Embroidery, Bamboo weaving, manufacturing the dragon lantern	Caidiao Opera; Shoulder pole dance; Shigong Dance; Bamboo Canister Dance; Wan Songs and Cloth patch embroideries	Grass Drago Dance; Meishan Martial Arts; Xinhua Folk Songs	Wood and bamboo sculptures and folk songs	Hani archaic songs, Lezuo dance, Four seasons production songs and others.	-
	Food culture	The long-table feast of the Hakka; Bamboo rice,	Cooked Dish; Prickled; Preserved meat; Snacks; Tea	Unique Hot and Sour Food Culture. There is a series	Rice and pickled food	Make full use of locally grown and wild ingredients.	Make full use of locally grown and wild ingredients.

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		Nine-layer rice cake, Huangyuan glutinous rice cake, Yellow ginger tofu, Mugwort glutinous rice dumplings.	and Liquor and wine	typical food called “ten courses of meat, ten courses of vegetables and ten kinds of drinks”, among them, the Frozen Fish of Shuiche Town is the most famous.			
	Costume culture	Hakka costumes, Traditional costumes of the She ethnic group	Women's clothing of Zhuang and Yao ethnic minorities	-	-	Women weave cotton cloth with indigo dye, with a variety of medicinal materials made of breathable ethnic costumes. The festival is decorated with embroidery, accessories and silver ornaments.	-
	Architecture culture	The mud huts basically follow the traditional style of the Han ethnic group in northern China in ancient times.	The Stilted Farmhouses of Zhuang People; the Stilted Farmhouses of Zhuang People ,the architectural culture embodied in the stilt houses or pile dwellings, the stone culture signified by the tablet inscriptions and flagstone paths.	Traditional villages featured by plank houses. Plank houses use wood as the raw material and two-story column-and-tie construction as the main external construction style.	Traditional buildings are made of rock base, wooden wall and tiles made of burnt clay. The structure called “Cuo” is their feature in which has a complex arrangement with aisles.	Mushroom house. The mushroom house is usually built 3 floors. People keep animals and lay tools on the first floor; live on the second floor; and store foodstuff on the third floor. The buildings are made of mud, stone and straw.	A small house, made of wood, with a tapered roof is typical traditional building in the heritage area. The wood takes from their private forest “Muyoung”.

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	Belief	Folk beliefs with ancestor worship, Land God, Door God, Kitchen God, Shangbao Altar God and Lord Wenchang. Taoism, Buddhism and Confucianism	Natural gods worship; Taoist and Witch belief	Traditional belief featured with unique Wu-Nuo Witchcraft Culture	Natural gods worship and Taoism	Natural gods worship, includes in rice-god and holy trees worship.	Natural gods worship and Christianity
	Social organization	Hakka Clan	the “Following the Order of the Oldest” system; rural regulations and laws	Villager self-government organizations; management according to village regulation and agreement	Villager self-government organizations; management according to village regulation and agreement	Migu and Mopi are the psychic leader in the village. Traditional rules guide the actions of the villagers.	The societies have good tradition of rural plannings.
<b>Remarkable landscapes, land and water resources management features</b>	Spatial distribution	The four rice terraces have formed a remarkable vertical landscape that is comprised of four key elements that are forests, terraced fields, villages and rivers from the top of the mountain to the bottom..					
		The cultivation culture combined well with the fertile local terrain and evolved into a new “forest - bamboo - tea - village - terrace – stream” mountain agriculture system in which species and landscapes are diverse and people live in good harmony with nature.	In the stereoscopic arrangement of forests on the mountain top, villages on the mountain sides and terraced fields on the sides of villages and at the foot of the mountains, the water and soil conservation is balanced with the eco-system.	A harmonious landscape of the four elements, namely the forests, terraced fields, folk houses, and rivers, is formed in the Ziquejie Terraces	A spatial framework of forest for water resource - bamboo forest – village – terrace – combination of terraces and villages - river conservation is thus formed from top to bottom.	It is comprised of “forest, village, terrace and water”. The Hani villages are built on the mountainsides, above the village are the flourishing forests and the terraces are just below the villages. The water flows through them.	The forest lies on the top of the mountain. The villages located among the terraces in pieces.

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Forest	Forest	The forest is above the village, covering 87% of the terrace system. It includes the bamboo garden, tea garden and primary forests and secondary forests which both are dominated by subtropical evergreen broad-leaved forest and subtropical deciduous broad-leaved forest.	The high ranges between the elevation areas of 1,100m-1,916m are forest zones, and below the zone, the evergreen forest vegetation such as arbors, bushes and grasses are distributed in the cubic climate formed at different elevations.	Forest coverage is up to 68%. Forests are mainly distributed above the terraces or around the villages and have four layers.	Forest coverage is up to 66.89%. The forest is distributed above the village, including evergreen forest, bamboo and tea garden.	The forests cover the top of mountains, with the latitude of more than 2000m.	The forests distribute widely, which takes 70% surface area of the heritage zone.
	Terraced fields	Slope of terraces is between 40°-70°; Elevation of terraced fields is from 280 to 1260m; Many terraces fields are mostly broken plots. “Daiziqiu” and “frog hops three fields”	On the Longji Ridges, where there is streams, there are terraced fields of various shapes and sizes, most of them are narrow, big but one acre, some tiny rice fields even smallest than a raincoat. Slope of terraces is between 26-35°, and maximum can reach 60°.	Slope of the terraces is between 25°-40°, with the deepest slope of 50°. There are more than 500 levels of terraced fields, most of which are located at an altitude of 500-1,000 meters with the highest elevation of 1,200 meters and the lowest elevation of 450 meters.	Steep and narrow, mainly between 25-35° ; Terraced fields are from 100 to 900 m; The fields are described small as a bamboo hat or an eyebrow.	Mainly between 15-40°	More than 45°. The slope of the mountain can reach 70°.
	Village	The villages are big, which contain tens to hundreds families.					The villages are small, which contend less than 20 families.



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		Villages scatter in the terraces. No distribution difference of different nationalities.	The architecture is mostly Ganlan residence, made up of wood and stone, housing spacing is small, the overhead, no pillars of the foundation. Zhuang villages in the lower-lying areas, Yao, Miao and other ethnic villages distributed in the higher areas.	Traditional ganlan-style folk houses are interspersed between layers of terraced fields. These scattered folk houses make it convenient for local farmers to work in the nearby fields and use water.	The villages mainly distribute above terraces and part of villages disperses in terraces.	Yao and Yi people live higher than Hani people, who set their villages on the mountainside. Dai people live at the foot of the mountain.	The villages are located among the terraces in pieces.
	Water management features	The local people attached great importance to the protection of the forest on the top of the mountains. They ingeniously created the natural gravity irrigation system. The forest and the irrigation system are strictly protected and effectively managed by the local people.					Water is drained away by terraces and stone weir.
		Hakkas build some ponds on the top of the terraces and retain the original forest to maintain water levels.	In addition to Ping'an Zhai Yulan Reservoir, there are forest water, alpine swamps, alpine spring water, waterfalls and rivers that are also important reservoirs.	There are 69 weirs.	No facilities for storing water	Impounding reservoir	Stone weir
		No water segregator vessel	With simple control and regulation facilities, like water segregator vessel: a flat stone groove engraved with different widths	With simple control and regulation facilities, like water distribution recorded by carved wood or rock, effective water management	No facilities for allocating water resources	Water distributed by the block and wood scales	No facilities

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			according to how much water used by the lower terraced fields	can be realized.			
	Time diversity	The landscape in these rice terraces varies with time, which is different in different seasons					Only dry and wet seasons