

GIAHS Proposal

Globally Important Agricultural Heritage Systems (GIAHS) Initiative

Kuaijishan Ancient Chinese Torreya Community

Location: Shaoxing City, Zhejiang Province, P.R. China



People's Government of Shaoxing City

March, 2013

SUMMARY INFORMATION

<p>Name/Title of the Agricultural Heritage System (local Name and Translation, if necessary):</p> <p style="text-align: center;">Kuaijishan Ancient Chinese Torreya Community (local name: Xiang Fei)</p>
<p>Requesting Agency/Organization:</p> <p>People's Government of Shaoxing City, Zhejiang Province, P.R. China</p>
<p>Country/location/Site:</p> <p>This area is located in the north of Zhejiang Province, N29°25'-29°47' and E120°17'-120°38'. It includes 59 villages in 12 townships in Zhuji City, Shengzhou City and Shaoxing County.</p>
<p>Accessibility of the site to capital city or major cities:</p> <p>This area is 60Km away from Hangzhou City, the capital of Zhejiang Province. The nearest airport (Xiaoshan Airport) is 36Km away. This area can also be accessed by different railways (including Xiaoyong, Zhegan, Huhangyong, Hukun, etc.) and highways (including G104, G15W, G1512, G60, S22, S24, etc.).</p>
<p>Approximate Surface Area: 402 Km²</p>
<p>Agro-Ecological Zone/mountain forest ecological zone</p>
<p>Topographic features: The Kuaijishan Ancient Chinese Torreya Community is located in the southeast of Shaoxing City. The north part of Shaoxing City is comprised of plains, with valleys and low mountains in the central and southern areas. Ninety-five percent of the total area is covered by low mountains. The main peak elevation (Dongbaishan) is 1194.6 meters.</p>
<p>Climate Type: Subtropical monsoon climate</p>
<p>Approximate Population: 6.8×10^4</p>
<p>Main Source of Livelihoods: Chinese Torreya plantation</p>
<p>Ethnicity/Indigenous population: Han (98.15%); Minorities (1.85%)</p>

Summary Information of the Agricultural Heritage System:

The Kuaijishan Ancient Chinese Torreya Community is located in the north of Zhejiang Province, N29°25'-29°47' and E120°17' -120°38'. It includes 59 villages in 12 townships in Zhuji City, Shengzhou City and Shaoxing County. The total area is 402Km². There are around 1.05×10⁵ ancient Chinese Torreya trees. Among them, 7.2×10⁴ are more than 100 years old, and thousands of them are more than 1000 years old. A spectacular landscape is formed by the ancient Chinese Torreya trees, traditional villages, and abundant streams, and mountains.

Chinese Torreya (*Torreya grandis* cv. *Merrillii*) is a quality grafting plant resulting, over time, from careful artificial selection. Its main properties and economic values are different from other types of *Torreya grandis* and it can be used for nuts, medicine, logs, oil, ornaments, and environmental protection purposes. The Kuaiji mountain is the origin place of Chinese Torreya with the most well preserved ancient Torreya community, and more than 80% Chinese Torreya production is from this area. The Kuaijishan Ancient Chinese Torreya Community has over 2000 years of history. This Kuaijishan ancient community developed the application of grafting techniques in ancient China, which makes it a rare "living fossil" of ancient grafting and artificial selection techniques. The age of the oldest existing Chinese Torreya tree, already tested by experiments, is 1431 years, which might be the oldest living artificial grafted specimen in China. In addition, the Kuaijishan Ancient Chinese Torreya Community is a harmonious system that was created by the people of Shaoxing a long time ago that prevents soil erosion while providing diverse 'high value' economic products from the trees.

In all, the Kuaijishan Ancient Chinese Torreya Community not only has historical, artistic, scientific, ecological and economical value, but also reflects a highly sustainable mode of human survival through the careful transformation and utilization of natural resources; the harmonious coexistence of humans with nature. It is a unique GIAHS system in the world. Nevertheless, the Kuaijishan Ancient Chinese Torreya Community is facing severe threats and challenges due to natural aging, natural disasters, land use competition, population aging, and the lack of agriculture labor resources. It is urgent to establish the social, economic and ecological values of this important system and protect them in dynamic ways.

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1. System Characteristics

Global (or national) importance

Torreya grandis is a type of tertiary relict plant that originated in China. It is a unique plant and a secondary level key protected wild plant in China, which is widely distributed in broad-leaved mixed forest zones in eastern and central China.

Chinese Torreya (*Torreya grandis* cv. *Merrillii*) is a type of quality grafting

plant resulting from artificial selection. Its main properties and economic values are different from other types of *Torreya grandis* and it is a valuable plant that can be used for nuts, medicine, logs, oil, ornaments, and environmental protection purposes (Figure 1).



Figure 1. Chinese Torreya Tree

The Kuaijishan region is the central concentration of Chinese Torreya. Torreya is distributed in Anhui, Jiangsu, Jiangxi, Hunan, Hubei, Sichuan, Yunnan, and Guizhou provinces. Over 40 districts in Zhejiang province also have Torreya. However, Chinese Torreya is only found in the Kuaijishan and Dapanshan districts, which are in Zhuji, Shaoxing, and Shengzhou in Shaoxing city, and in Dongyang, Pan'an, and Pujiang in Jinhua city. Currently, Zhuji City, Shengzhou City and Shaoxing County contain 20 thousand hectare of Chinese Torreya, which accounts for over 80% of national Torreya production. Thousands of Torreya trees are over a thousand years old, which makes these areas the best preserved ancient Torreya flora in the world.

The Kuaijishan Ancient Chinese Torreya Community has over 2000 years of history and the age of the Chinese Torreya trees was already traced back to 1431. *Torreya grandis* is a mysterious dioecious fruit tree (Figure 2). Because of its long life span, slow growth, late fructificative stage, and long fruit bearing stage, the Torreya tree's fruit bearing period can reach hundreds or even a thousand years. Torreya trees over a

thousand years can still produce large quantities of high quality fruits.

According to historical agricultural records, fruit tree grafting techniques were already widely promoted in China 1500 years ago. The Kuaijishan Ancient Chinese Torreya Community represents the application of grafting technique in ancient China, which makes it a rare "living fossil" of ancient grafting and artificial selection technology.



Figure 2. Mysterious Chinese Torreya

As an ancient agricultural heritage system that existed for over thousands of years, the significance of Kuaijishan Ancient Chinese Torreya Community is characterized in the following areas:

1.1 Food and livelihood security

Kuaijishan has a long agriculture history and grows a wide variety of crops. Economic crops have always been a major part of the region's agricultural production and the foundation of its development. The Kuaijishan Ancient Chinese Torreya Community mainly provides products such as Chinese Torreya, cherries, bamboo shoots, chestnuts, melon seeds, grapes, sweet potato, and mountain Yunwu tea, etc. Chinese Torreya is one of the region's key economic plants and the main source of income for local farmers. Therefore, it is very significant for the livelihood security of local farmers. Due to a well-established marketing mechanism over the past few years, the income of Torreya farmers has gradually increased. Currently, the total Torreya planting area in the city of Shaoxing is 20 thousand ha, with 9667 ha in Zhuji, 7467 in Shengzhou, and 2533 ha in Shaoxing County, with a total production area of 5667 ha. In 2010, the total Torreya production in the Shaoxing city was 2570 tons. Among them, Zhuji, Shengzhou, and Shaoxing County produced 2565 tons, which accounted for over 80%

of the national total. With the price of 170 Yuan per kg, the total value of Torreya production was 437 million Yuan. In Dongbaihu and Zhaojiazhen villages of Zhuji city, the average annual income per capita of Torreya alone can reach over 8000 Yuan, which accounts for over 80% of the annual income per capita. In Guolingcun Village, the average income per capita is 6106 Yuan and Torreya accounts for 5800 Yuan of that income, which is 95%. Chinese Torreya has a variety of purposes. Not only it can be processed into dry fruits, it is also a valuable Chinese herbal medicine material. Its kernel can be pressed for oil, and its episperm can be used as spice and timber.

1.1.1 Edibility

The size of Chinese Torreya kernel is similar to the date seed and its taste is similar to that of peanuts, but more unique (Figure 3). The secondary processing of Chinese Torreya has many varieties. Its kernel can be made into Torreya cake, pan cakes, candy, and shortbread after being fried and these



Figure 3. Chinese Torreya Product

products are exported to places including Hongkong, Macao, and Japan, and are very popular. Chinese Torreya is also rich in nutrition. Every 100 grams of Torreya contain 6.4g of water, 10g of protein, 44.1g of fat, 29.8g of carbohydrate, and 6.8g of crude fiber, etc., plus 71mg of calcium, 275mg of phosphorus, and 3.6mg of iron. Torreya also contains palmitic acid, stearic acid, oleic acid, linoleic acid, oxalic acid, sugar, and multi vitamins. Furthermore, Torreya contains minerals including calcium, potassium, magnesium, iron, manganese, chromium, zinc, copper, nickel, fluorine, and selenium.

1.1.2 Medical Value

The medical value of Chinese Torreya was recorded in many ancient books such as Compendium of Materia Medica (Figure 4). Torreya oil can selectively decrease

serum total cholesterol (TC) and glycerin trilaurate (TG), and increase high density serum lipoprotein cholesterol (HDIL-C). The four types of lipo-alkaloids of the Torreya kernel can suppress lymphatic leukemia and is beneficial to the prevention and treatment of malignant lymphosarcoma. Due to the high level of Vitamin E and fatty acid contents, regular use of Torreya can delay the aging process. Like other yew plants, Torreya contains the anti-cancerphysiological activator-paclitaxel. The Torreya aril contains 5 types of cancer prevention chemical compounds, including Torreya grandis ester, 18-oxygen ferruginol, 18-hydroxy ferruginol, hinokiol, and labdane derivative. Torreya also has a high content of Vitamin A which is beneficial for the prevention and improvement of eye dryness and nyctalopia. The discipline of traditional Chinese medicine considers that, due to its high fat content, Torreya can serve the purpose of treating coughs and improving respiratory functions. It is also suited to treat constipation, hemorrhoids, dyspepsia, colic, and coughs, and can be used to control various intestinal parasites, such as hookworm and pinworm. It can also be used to treat infantile enuresis.



Figure 4. Ancient records of the medical value of Chinese Torreya

1.1.3 Raw Material Supply



Figure 5. Wood carving made of Torreya grandis

Torreya aril contains approximately 1.4% of citral and 1.7% of linalyl acetate which are excellent raw materials for aromatic oil. Every kilogram of aril can produce 200-300 grams of distilled oil. Torreya timber is hard and smooth, dense in texture and has no cracks and deformations,

which makes it an excellent material for making furniture, ships, and wooden sculptures. Kuaijishan has been using *Torreya* for ship building, coffin making, and house beams since the West Jin Dynasty. During the East Jin Dynasty, the bookshelves and desks built in Kuaijishan were cherished by scholars such as Wang Xizhi. By the Tang Dynasty, Kuaijishan *Torreya* wood had gained a national reputation.



Figure 6. Funitures by *Torreya grandis*

1.2 Biodiversity and ecosystem function

1.2.1 Biodiversity

(1) The diversity of *Torreya*

There are 6 species of *Torreya* worldwide: 2 species of *Torreya* in America, which are Florida and California *Torreya*, 1 specie in Japan, known as Japanese *Torreya*, and 3 species in China, known as Chinese *Torreya* tree, Bashan *Torreya*, and long-leaf *Torreya*, plus 2-variety *Torreya*, known as Yunnan *Torreya* and Jiulongshan *Torreya*. The Kuaijishan region has long-leaf *Torreya* and Chinese *Torreya* tree (Appendix 2). *Torreya grandis* is the result of the grafting of the Chinese *Torreya* tree. Kuaijishan is the original and key production region of Chinese *Torreya* which today contains the whole Chinese *Torreya* resource. According to research, the Kuaijishan region contains over ten types of Chinese *Torreya*, including fine *Torreya*, tusks *Torreya*, large round *Torreya*, mid round *Torreya*, small round *Torreya*, sheep horn *Torreya*, walnut *Torreya*, peanut *Torreya*, and wood *Torreya*.



Figure 7. Different types of Chinese *Torreya*

(2) Agricultural Biodiversity

The Kuaijishan region contains a wide variety of agricultural crops, including food crops such as rice, corn, wheat, barley, potato, and beans, oil crops such as peanuts, rapeseed, and sesame, important cash crops such as tea, chestnuts, dried bamboo shoots, *Torreya grandis*, Chinese tallow trees, mushrooms. The area also contains many Chinese herbal medicines and is known for silkworm breeding. Additionally, there is a rich variety of fruits and vegetables. Data has shown the region contains 22 types of rice, 13 types of corn with 1 local corn type, 4 types of wheat with 2 local types, and 6 potato types. The local region also has many farm animals including pigs, cattle, sheep, rabbits, chickens, ducks, geese, and bees (Appendix 2).

Over recent years, the Kuaijishan region has combined ecological conservation, agriculture, forestry, and herding together in developing an ecological sound agricultural circulation system and a unique food processing industry, which forms a composite culture where *Torreya grandis* serves as the key component.

(3) Relative Biodiversity

The Kuaijishan region has many complex geographical features, a well conserved ecological system, and a wide selection of animal and plant species. Data has indicated that there are a total of 766 species of plants in the system, including 25 families and 42 species of pteridophytes, 7 families and 18 species of gymnosperms, 98 families and 606 species of dicotyledon, and 11 families and 100 species of

monocotyledons (Appendix 2). The system contains a total of 266 species of animals, including 24 families and 199 species of birds, 18 families and 48 species of mammals, and 5 families and 17 species of reptiles (Appendix 2). The ancient ecological system of Kuaijishan region holds a number of rare and endangered wild animals and plants. Four species of plants are listed as national key protection plants, including 1 priority level protection plant, the Metasequoia, and 3 secondary level protection plants, Chinese Torreya grandis, Ginkgo, and Eucommia Ulmoides. There are also 11 species of animals that are listed as national key protection animal species, including 2 species of endangered pangolins and rat snakes, 1 species of a priority level protection animal, the black moose, and secondary level protection animals including Merlin, silver pheasant, chicken, otter, clouded leopard, and 8 species of serow (Appendix 2).

1.2.2 Ecosystem Services

The Kuaijishan Ancient Chinese Torreya Community plays an irreplaceable role in maintaining biodiversity, ecological balance, and environmental protection. Its major ecological service functions are reflected in the following categories:

(1) Biodiversity Maintenance

The Kuaijishan region is mainly covered by Torreya grandis forest, coniferous forest, and Mao bamboo forest, with some evergreen broad-leaved forest. National level protection plants are widely distributed in the area. Coniferous plants include pine, cypress, China fir, and cryptomeria fortunei, etc. Broad-leaved plants include Fagaceae, Lauraceae, and Theaceae species, etc. The combination of these plants forms well-forested vegetation and maintains a relatively complete forest ecological system and considerable biodiversity. One of the key functions of the Kuaijishan Ancient Chinese Torreya Community is to protect the traditional local species of Torreya and their growth environment in order to maintain biodiversity, especially in conserving the genetic diversity of crops. The diversity of these traditional local crop species is the foundation for maintaining agricultural diversity.

(2) Water and Soil Conservation

Kuaijishan is located on the southeast coast of China, and due to frequent rain in the typhoon, soil erosion is serious in the region. Chinese Torreya grows on mountains with 200-800m altitude and because it is a type of evergreen plant, it is good for soil and water conservation. Studies have shown, compared to tung tree forest, tea-oil camellia, chestnut forest, tea garden, mulberry garden, and fruit garden, Torreya grandis forest is associated with the lowest level of erosion. The planting of Torreya forest does not damage the original plant environment, which also prevents erosion. Our ancestors cultivated Chinese Torreya through long periods of artificial selection and grafting wild Torreya and built fish scale pits and terrace fields around the Torreya forest for the cultivation of tea, food crops, vegetables, and pasture, which formed a unique agro-ecological production system. This is a special system that was created by the people of Shaoxing a long time ago, which prevents erosion while providing high economic returns.

(3) Water Resource Conservation

Because Torreya's has a large leaf area, bushy canopy, thick defoliation layer, and putrescibility, it is very valuable in conserving water resources. The soil where Torreya is planted contains high levels of organic matter and is usually over 50cm thick, which makes it fertile and well ventilated. Its water conservation function is reflected in 3 ways: canopy interception, water conserving ability of defoliated leaves, and soil water reservation ability. Research indicates that the annual water conservation quantity of ancient Torreya forest is 1026.3 ton/ha, much higher than the China fir forest, which conserves 34.20 ton/ha of water annually.

(4) Climate Adjustment

The large canopy layer of the Kuaijishan Ancient Chinese Torreya Community can adjust the temperature and humidity between the atmosphere and the earth's surface, forming a microclimate within the forest, which can have ameliorating impacts on the surrounding environment. The canopy can absorb and reflect sunlight and weaken

solar radiation, and therefore leads to smaller annual and daily temperature variations. Low temperature, high humidity, and a large Torreya plant area have made the formation of fog, dew, frost, and soft rime easier, which increases the level of precipitation and moisture available. Studies have shown that the temperature within the Torreya forest is 4.4C lower than outside, and the humidity increases by 17.4% in the forest. This indicates that Torreya forest can help to adjust the climate with many beneficial outcomes.

1.3 Knowledge systems and adapted technologies

Through thousands of years of real life practice, the people of Kuaijishan region have gained a complete set of knowledge and techniques that range from the planting and grafting of Chinese Torreya to the processing of Torreya kernel. This can be seen in the following aspects:

1.3.1 Grafting

Grafting is an important cultivation technique that improves the quality and production of Chinese Torreya (Figure 8-10). According to scientific studies, the age of currently existing grafted ancient Torreya grandis can reach 1431 years old. Thus, the grafting history of Kuaijishan can be traced back to over 1400 years ago. The people of Kuaijishan usually use stock that is more than 10 years old for Torreya grafting, and the number of



Figure 8. The clear grafting mark on the ancient Chinese Torreya trees

braches used for grafting depends on the age of the tree. The traditional grafting period is between late February and early April, because the temperature is beginning to increase and the roots of plants are more active, which increases the chance of

successful grafting. High position grafting is the most common technique among the traditional grafting practices. According to statistics, more than 100 thousand Torreya trees over 50 years old in Kuaijishan have been grafted using such techniques.



Figure 9. Multiple grafting for young Chinese Torreya trees



Figure 10. Low grafting of Chinese Torreya trees

1.3.2 Harvest and Processing

The growth period of Chinese Torreya lasts for 17-19 months. During the first year, it blooms in April and the fruits mature in September. Afterwards, Torreya aril turns from light green to dark green every year during early and mid-September, and the maturation of the fruits is indicated when the aril shows cracks. This is when the harvesting season begins for Torreya farmers. A special bamboo basket can be used for picking fruits, or they can also be picked by hand. Because the Torreya trees are usually very tall, the picking process requires a high level of proficiency. To ensure



Figure 11. Pickup of Chinese Torreya

safety, people often use regular ladders or a local tool, known as the "centipede ladder", to climb up the trees. They use one or more ropes to tie the branches together in order to disperse the heavy weight. The special bamboo basket is used to bring picked fruits to the ground (Figure 11-16).



Figure 12. Regular ladder



Figure 13. The centipede ladder



Figure 14. The centipede ladder



Figure 15. Back home with Chinese Torreya

Traditional processing technology of Chinese Torreya includes 11 stages: stacking, peeling, washing, drying, stir frying, removing from heat, soaking, draining, baking, cooling, and picking. All procedures are done manually (Figure 17-18). Modern processing is based on and derived from traditional procedures and uses mechanical operations instead of manual operations. Modern procedures mainly include two methods, "double stir



Figure 16. Harvesting

"fry" and "double heating". The frying of Torreya is very special and the technique, heat control, and skills are all important aspects of the process. Torreya fried by local farmers tastes better than any other Torreya because the people know the right ways to control heat and time. So only the people in the Torreya planting areas can fry the best Torreya. Because descriptions such as "right timing" and "when the inherent smell of Torreya appears" are very vague, it requires a long periods of practice to perfect. The traditional processing technique of Torreya has been inducted into the fourth group of intangible cultural heritage protection list in Zhejiang province.



Figure 17. Drying



Figure 18. Frying

1.3.3 Compound management

Chinese Torreya thrives in the warm wet places. The young trees need to be protected by shelters. The growing trees need plenty of sunshine and open environments to facilitate the pollination process. In the Kuaijishan area, the Chinese Torreya trees are always planted



Figure 19. Intercropping of Chinese Torreya

together with vegetables (for example beans, potatoes, etc.), crops (for example wheat, corn, etc.), fruit trees (plum, waxberry, cherry, etc.), tea plants, or medicinal herbs. The local residents also raise some poultry in the Chinese Torreya communities

(Figure 19-21). The farmers grow different plants together with Chinese Torreya by taking into account the difference in height and root depth, and also their fertility and sunshine needs, thus they can make full use of the space, achieve better economic returns, and also conserve the water and soil at same time.



reya

1.3.4 Traditional fertilization

According to the traditional fertilization methods in Kuaijishan, Torreya is fertilized by natural farm fertilizers during September and October of every year. Torreya tree skins, domestic waste, and human and animal feces are placed in a hole that is 20cm deep and 30cm away from the tree trunk (Figure 22). This measure ensures the nutrient supply for Torreya trees while significantly increasing rat control.



1.3.5 Traditional Disease, Pest, and Bird Controls

Local farmers use a series of techniques, such as water and soil conservation, soil tillage, fertilizer management, tree clipping, and density control, during the cultivation of Torreya forest to create conditions that are beneficial to Torreya tree growth, but

are a disadvantage to the occurrence of disease and pest problems. This is a form of natural pest control. Additionally, the local farmers also use traditional methods, including hanging bright objects such as colorful cloths, mirrors, and pot covers, to prevent bird problems (Figure 23).



Figure 23. Traditional methods for preventing birds

1.4 Cultures, value systems

and social organizations (Agri-Culture)

The Kuaijishan Ancient Chinese Torreya Community is a unique local symbol, recording and utilizing thousands of years of history. The Torreya farmers of Kuaijishan extend this culture by inheriting traditional ideas and practices in organizing village activities, sacrifices and holiday festivals. Through the inheritance of Torreya culture, the social history and cultural memories such as family values, local history and social rituals are blended together and remembered as a whole, which leads to the formation of social identity and cultural consciousness. Therefore, family, village, and traditional livelihoods based on Torreya culture receives continuous development. Torreya culture is not only based on agricultural production, but is combined with other relevant forest cultures. Most importantly, due to the unique features of Torreya, such as long life span, dioecism, and the ability to grow two generations of fruits on a single tree, it symbolizes the meaning of "longevity, happiness, and reunion", which blends into every aspect of the local social culture.

1.4.1 Chinese Torreya and Its Cultural Images

As a nutritious and valuable dry fruit, Chinese Torreya and its products usually appear as precious gift during Chinese holidays (Figure 24). It serves as a type of high quality fruit during the traditional "four seasons and eight solar terms" for example. Chinese Torreya is also a necessary part at the life etiquette of the people of Kuaijishan. In the

villages of Shengzhou, Zhuji, and Shaoxing County, Chinese Torreya is often a part of wedding ceremonies. Two Chinese Torreya fruits represent the meaning of "couple" and togetherness. The children who eat these Torreya symbols would shout out "Shengjie", meaning the couple will have baby soon. The Torreya would be given to relatives and friends after the wedding. One of the plates in the bridal chamber will certainly be Torreya, and people would also say auspicious phrases using Torreya to send well wishes to the couple. The one that speaks the best "lucky" phrases would be given the Torreya fruits.



Because of these traditional and positive messages that Chinese Torreya represents, many beautiful stories and legends are widely spread in the Kuaijishan region. Chinese Torreya is known as the "saint fruit" in these stories, and people use their rich imagination to explain the source of Chinese Torreya. The farmers of Jidong village in Shaoxing County think that Chinese Torreya is stolen from heaven and brought to them by two fairies. The farmers of Zhaojiazhen village in Zhuji city think the source of Chinese Torreya is from Chang'e, the goddess of the moon, and there is a legendary saying that a bat demon is suppressed by a fingered citron tree. The Tongyuan village



of Shengzhou city has the legend that the seven fairies from heaven have brought the Chinese Torreya to them (Figure 25). The farmers of Jidong village believe in the Shun Bodhisattva, and the area has a legend that Chinese Torreya originated from Shun's wife, who

orreya

became the goddess of Xiang River, known as Xiang Fei. In some stories, the first emperor of the Qin Dynasty and Emperor Qianlong of the Qing Dynasty very much appreciated Chinese Torreya after tasting it. The two eye-shaped bumps on Chinese Torreya are still being called "Xishi Yan" (the eyes of beauty).

These beautiful images of Chinese Torreya are also loved and recorded by writers and poets. With Kuaijishan as the center, there are large quantities of Chinese Torreya associated poems, literature, couplets, paintings, proverbs, calligraphy, drama, and songs in the southern regions of the Yangtze River. Poems, literature, and couplets are artistic forms that describe the surrounding environment, and many dignitaries, writers, and scholars have gathered in Zhejiang throughout history, leaving many poems and writings that express their appreciation of Chinese Torreya. For instance, writings about Chinese Torreya by famous Chinese writers such as Su Shi, Mei Yaochen, and Ye Shi are considered historical masterpieces. Legendary fiction, such as Journey to the West (Xi You Ji), also constantly mentions the values of Chinese Torreya. Furthermore, legends and stories associated with Chinese Torreya are also preserved to this day. There are also people that recorded the beauty and legends of Chinese Torreya through art forms such as paintings and drama. Chinese Torreya associated folk songs are relatively small in number; these being mainly from impromptu songs created by local residents during the course of wedding ceremonies.

1.4.2 Agriculture Associated Culture Characteristics

Chinese Torreya is an important livelihood resource for the farmers of Kuaijishan. Other products around the Chinese Torreya forest include bamboo, fruits, and tea, which enrich the food variety for local residents. Bamboo can also be made into a wide range of tools



Figure 26. Bamboo hooks

that are mostly used for Chinese Torreya picking, processing, and in daily life. For example, bamboo tools include long hooks, centipede ladders, and baskets (Figure 26-28).



Figure 27. The centipede ladder

Figure 28. Bamboo baskets

The importance of Chinese Torreya and the risk for picking their fruits have made "high production" and "safety" the biggest concerns of local farmers. Many blessings and sacrificial festivals have resulted from such wishes. In Shengzhou and Zhuji mountain areas, local farmers organize festivals every January (lunar calendar) to wish for high production of Chinese Torreya. For example, in Tongyuan and Changle villages of Shengzhou, local farmers gather around the family's largest Torreya tree for a sacrificial festival on January 14th of each year to wish for higher Torreya production. During harvest season, either the village or family would come together to organize different types of worship activities to wish for safety while picking Chinese Torreya fruits (Figure 29). Depending on the different worshipping gods, there are three types of worshipping activities: to local gods, to mountain gods, and ancestor worship.



Figure 29. Sacrificial activities

The local residents of Kuaijishan believe in the Yuan Tan Bodhisattva. The Yuan Tan Bodhisattva's surname is Zhao, and is titled Xuantan (martial god of wealth). In ancient time, the residents would gather on lunar July 1st every year to worship Yuan Tan Bodhisattva to wish for better Torreya production and peace and safety. This activity has evolved into a local temple fair today.

1.4.3 Forms of Social Organization

The main ethnic identity of people in the Kuaijishan region is Han. Family is the basic social unit, and kinship is the foundation of the social structure. As the society develops, this family-based social structure is gradually transforming. Currently, only a few old houses, ancestral



Figure 30. "Mingtang" of the traditional houses

halls, schools, and villages established in the Ming and Qing Dynasty that are protected by the cultural relics protection agencies can reflect the social form of Kuaijishan over hundreds of years. Residential houses or dwelling units can be identified through the form of Taimen (platform gate). Specifically, Taimen can be categorized by superior, middle class, and lower class. The number of units is singular. Taimen, or gates, form an axis, with either two or four units on both sides. The courtyard in the middle is known as "Mingtang" (i.e. bright hall) (Figure 30). The head of the house lives in the units in the front, and other residents live on the sides.

Lv Ao ancestral halls are the representative ancestral halls in the region, and most of them were built during the Qing Dynasty. The family would organize meetings or ceremonies in the halls during important events. The ancestral halls are in courtyard form with a stage (Figure 31), corridor, and courtyard well, etc. The biggest feature of Lv Ao ancestral halls is that they are all built with ancient Torreya trees of over a thousand years old, which make them especially strong and durable.

There are many families gathered in these historical villages and towns, which preserve the memories of traditional cultures and social organizations. Chongren town, formerly known as Xinghuacun village, is the representative of historical towns



Figure 31. Stages in the ancestral hall in Lv Ao Village

in the area and has nearly a thousand years of history. During the time of

Emperor Xining of the Northern Song Dynasty, the Qiu family was appointed by the emperor to move to this area, and because the Qiu family believed in justice and humanity, the village changed its name from Xinghuacun to Chongren, meaning 'humanity advocate'. The town still has large areas of well-preserved ancient houses and buildings. These constructions are mostly built in the Song Dynasty style with features from the Ming and Qing Dynasty. The ancient buildings include temples, ancestral halls, drama stages, residential houses, memorial archways, herbal medicine shops, stores, bridges, ponds, and wells. Using the Master Yushan temple as the center, there are over 100 ancient Taimen, all connected with building hooks, which reflects the legacy of "multiple units, one family".

Chinese Torreya associated social standards, morality, culture, and social structure have made great impacts on the formation of moral values in many younger generation. Young people would imitate, criticize, and learn from their parents' generation and form new social cultures, but new cultures would still preserve and inherit elements from older cultures. Nowadays, national laws



Figure 32. Village regulations

and policies are the basic principles for rural land management in the region. Based on this principle, the region has formed unique civil rules regarding the management and protection of Chinese Torreya trees. Among them, there are specific rules for the distribution and harvesting of Chinese Torreya, and fines for theft and other rule breaking behaviors (Figure 32).

1.5 Remarkable landscapes, land and water resources management features

The vegetation in the Kuaijishan Ancient Chinese Torreya Community is subtropical evergreen broad-leaved forest. Due to the differences in microclimate and soil and water environment caused by elevation and topography, plus the effects of artificial plants, there is a wide variety of vegetation in the forest, including broad-leaved forest, coniferous forest, broad-leaved and coniferous mixed forest, bamboo forest, and shrub forest. Coniferous plants such as fir and pines are the main vegetation types at over 600m above sea level, with shrubs and grass on the top of the mountains. Chinese Torreya trees are mainly distributed at elevations from 300m to 600m. They mainly grow by rivers and in canyons where the climate is cool and wet during the summer under the elevation of 400m, and are widely distributed above the elevation of 400m. Economic plants such as tea trees, chestnuts, and bamboos are also found in this region. New cultivated Chinese Torreya seedlings and fruit trees are often grown under the elevation of 300m (Figure 33).



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Chinese Torreya is dioecious and a type of subtropical tree species, and can live for hundreds or even over a thousand years. Because of its special features such as a long life span, its evergreen properties, and its beauty, it is crowned as "longevity tree",



Figure 34. Beautiful ancient Chinese Torreya trees

"saint fruit", and "wealth tree" by local people and visitors. The landscapes and shapes of ancient Torreya trees are various and beautiful. Some trees have large connected branches, which look similar to crouching tigers and hidden dragons, and some have unique shapes and grow between mountain cracks.

These ancient Chinese Torreya trees, the interesting mountains and the rich culture of the Kuaijishan community have formed a special tourism resource (Figure 34).

Because of the complicated geographical features in Kuaijishan and because many Chinese Torreya trees are distributed in steep areas, soil and water conservation is an important topic in ancient tree management. The farmers of Kuaijishan use terrace or build bamboo fences and piles of stones for fish-scale pits on steep hills to prevent erosion. Terraces built with stone piles have become a unique natural landscape feature in Kuaijishan (Figure 35-36).



Figure 35. Piles of stones around Chinese Torreya trees



Figure 36. Manmade terraces to prevent the soil erosion

2. Historic relevance

According to *Er Ya*, Chinese Torreya has over 2000 years of history. Although there are no records showing the exact time of Chinese Torreya usage, according to the measurements of the age of existing Chinese Torreya trees, the crafting and

cultivation of Chinese Torreya is no later than the South and North Dynasties, and sporadic cultivation of Chinese Torreya is thought to have begun before this time. The earliest reliable record of Chinese Torreya fruits was during the Tang Dynasty. The *Compendium of Materia Medica* has descriptions and edibility of Chinese Torreya, showing that Chinese Torreya had become a famous local dry fruit. During the North Song Dynasty, Chinese Torreya had become a valuable fruit recognized by many scholars and bureaucrats. The famous poet of the North Song Dynasty, Su Shi described Chinese Torreya as a valuable fruit that represents beauty and luck. After that, many agricultural books, such as *Florilegium*, recorded the characteristics and mutations of Chinese Torreya. These records indicate that, through long periods of cultivation by the Chinese people, Kuaijishan had already developed a high quality species of Chinese Torreya at that time. Due to wars in northern China during the end of the North Song Dynasty, large populations migrated to the south, which led to the rapid population increase in Kuaijishan. People built farms on plain areas, and also in the mountain areas of Kuaijishan. The loss of vegetation led to the destruction of the environment, but Chinese Torreya forest was able to survive due to its ecological resilience and strong economic value and formed a unique mountain land use system.

After the Song Dynasty, the cultivation and application of Chinese Torreya entered a fast development stage. During the South Song Dynasty, Shengzhou and Zhuji had already become high quality Chinese Torreya production areas. During the time of Emperor Wanli of the Ming Dynasty, the *Record of Shengzhou* indicated that there are two types of Torreya grandis, and Shengzhou has the highest production of Torreya, which means that Shengzhou has had Torreya trees from over 400 years ago and one of the Torreya species is possibly the Chinese Torreya that people can see today. During the Qing Dynasty's Emperor



Figure 37. Ancient records of Chinese Torreya

Qianlong's time, the word "Chinese Torreya" (Xiang Fei) appeared in the literature as an official name (Figure 37). The *Record of Zhuji County during Emperor Qianlong* has shown that among the two types of Torreya, the thinner type is the best, and it is called Chinese Torreya. During late Qing Dynasty, the Revised Record of Zhejiang stated that a small village in the east of Fengqiao is the origin of Chinese Torreya, and Fengqiao is today's Fengqiao town in Zhuji city. After the Republic of China was established, the large numbers of articles, news, studies, and scholarly papers about Fengqiao Chinese Torreya reflect the significant impacts of Chinese Torreya production.

The remaining ancient Chinese Torreya forest can be traced back to the late Tang Dynasty, which is more than 1000 years ago. Obtaining high quality Chinese Torreya through grafting had become a common practice at that time. Most of the ancient Chinese Torreya trees in Kuaijishan today that are over a thousand years old have obvious grafting marks (Figure 8). Even today, the grafting and breeding of Chinese Torreya in other regions still uses the Kuaijishan method as a sample.

Kuaijishan's exceptional environment and rich history and culture have provided a good ecological foundation and social environment for the formation and inheritance of ancient Chinese Torreya and its related culture. The Kuaijishan Ancient Chinese Torreya Community is a unique mountain land use system created by the people of Kuaijishan over a thousand years ago and under great livelihood pressure, which makes it an important agricultural heritage. One thousand years ago, without fertilization, the Kuaijishan Ancient Chinese Torreya Community has used its own circulation system to maintain normal functions while providing multi-purpose products, such as fruits, medicine, oil, and environmental protection, to the people, which is very significant for the sustainable development of food safety and agriculture. Chinese Torreya products represent a dynamic balance between human production, livelihood, and the nature, and moreover, it emphasis the coexistence and development of both humans and the environment. Most importantly, the traditional

culture contains the ideology of sustainability, which is why Chinese Torreya culture can be passed on from generation to generation.

3. Contemporary relevance

3.1 Increasing Employment Opportunity and Income

Currently, the Chinese Torreya industry is the key source of income of the residents in the Kuaijishan Ancient Chinese Torreya Community, and significantly improves the employment and living standards of local residents. The prosperity of over ten thousand farm families has been greatly improved because of Chinese Torreya businesses in the area. Using Feiwang village of Zhaojiazhen town as an example, Chinese Torreya associated income accounts for 70% of the village's total income. As Chinese Torreya production continues to grow, the value of the village's forest industry output increased from 3.30 million Yuan in 2000 to 8.90 million Yuan in 2010, at a 14.5% increase rate annually, and the annual per capita income of farmers increased from 6500 Yuan in 2000 to 13516 Yuan in 2010. Seventy-eight % of the population in the village is employed in areas such as Chinese Torreya production, processing, sales, and related services.

3.2 Leisure Agriculture

Chinese Torreya trees can be planted individually around houses and rivers or as a whole forest on mountains and hills, or they can form mixed forest with other trees, such as chestnuts, Mao bamboo, and other evergreen trees. Along with Kuaijishan's beautiful natural environment and unique climate, they have become an important resource for the development of leisure agriculture. Under local governmental promotion, Chinese Torreya has attracted large numbers of tourists with its special landscape features and rich culture. Today, viewing rare ancient trees and tasting dry fruits have become an important element in the local leisure program. Villages have built farm facilities for tourists and have attracted many tourists from places such as

Shanghai and Hangzhou, which have had positive impacts on improving the livelihoods of local residents.

3.3 The Sustainable Development of Agriculture

Chinese Torreya trees are designated by the local government as an economic plant with strong development potential. Chinese Torreya has significant potential for expanding in the mountain area and for building a high quality, efficient, ecological, and safe industry. Processing industries that rely on Chinese Torreya, Torreya forest parks, and farms have become highlights of positive ecological sustainability. Not only is the development of the Chinese Torreya industry an important new source of income for local people, but more importantly, it is also an ideal method for achieving the improvement of ecology, environmental protection, and socioeconomic activities, which is a key part for establishing new rural development in Shaoxing city. The systematic establishment of ancient Torreya agriculture protection can better conserve high quality Chinese Torreya resources and improve tourist developments, which will lead to better socioeconomic development and achieve harmony between humans and nature. Furthermore, products such as traditional Chinese Torreya, tea, and fruits can serve as leading forest product processing businesses and realize the sustainable development of the Chinese Torreya industry.

3.4 Ecological Function

The positive ecological functions of agriculture include climate adjustment, soil and water conservation, environmental purification, and biodiversity conservation, etc., while the negative functions of agriculture include resource consumption, environmental destruction, and biodiversity damage. Because the fertilizer dependency level of Chinese Torreya is already low, and the residents of Kuaijishan have planted chestnuts, Mao bamboo, and other economic crops in the forest, which further decreases the amount of fertilizer usage. Therefore, agricultural environmental protection is an important function in the sustainability of the Kuaijishan's ancient Torreya forest.

3.5 Promotion and Application of Technology

Because Kuaijishan's ancient Chinese Torreya has research values for many subjects, including nutrition, medicine, ecology, phytology, history, and geography, the city of Shaoxing established a number of research institutes for Torreya associated studies. For example, Zhuji City has always been concerned with the scientific research of Torreya, from the artificial pollination, grafting, and extraction of aril oil in the 1950s and 1960s to the establishment of the Forestry Institute in the 1970s and 1980s, it has accomplished a number of achievements, including anvil, grafting, and cuttage breeding. Over the past few years, under the leadership of the city government, Zhuji has promoted the application of scientific technologies in developing the Chinese Torreya industry, which led to the rapid increase in the area of Chinese Torreya production, and drove the development of Chinese Torreya industry in surrounding cities and towns.

4. Threats and challenges

The inheritance and protection of the Kuaijishan Ancient Chinese Torreya Community is facing severe threats and challenges due to natural aging, natural disasters, land use competition, population aging, and the lack of agriculture labor resources.

4.1 Regional Level

4.1.1 External Migration of Working-Age Labor Force

The traditional way of Chinese Torreya harvesting has high level risks and a high demand for labor. During harvesting season, the shortage of labor becomes one of the biggest worries for Chinese Torreya farmers. Some villages have established civil rules stating that working-age people of Chinese Torreya farm families must return home during harvest seasons, but it has not been effective. Today, most young people are leaving the mountain areas to do the work they want and to live in modern cities. Few people under the age of 35 participate in Chinese Torreya production and

management, and even fewer people have the ability to pick up Chinese Torreya from trees. Most people that participate in such agricultural work are over the age of 50, older farmers between the ages of 55 and 65 are the most important form of labor.

4.1.2 Increase in Natural Disasters and Pest Invasion Tendencies

Some Chinese Torreya trees are located in places such as hills, slopes, and cliffs, with barren, low nutrient soils, often under the threat of severe erosion. As the trees grow, the nutrients they absorb cannot fully supply the regular needs of the trees, which lead to severe malnutrition or even death. As the Chinese Torreya industry in the city of Shaoxing further develops, various pest invasions have occurred with increasing frequency, which not only leads to severe declines in production, but also poor quality and low economic values of Chinese Torreya fruits, creating great losses for Chinese Torreya farmers. Currently, the biggest problem of Chinese Torreya production is the difficulty in identifying the type of pest invasion and finding ways to prevent them.

4.1.3 Losing of High Quality Seed Resource

In the 1980s, the Kuaijishan region was under extreme poverty. Because of the appearance of male Chinese Torreya trees, they are considered to be high quality materials for making wood crafts and chess boards, and thus, large numbers of male Chinese Torreya trees were chopped down and sold by the villagers as a type of collective income, which led to a severe imbalance in the ratio of male and female Chinese Torreya trees. Because Chinese Torreya is a dioecious plant, the lack of male Torreya trees has led many Chinese Torreya trees to not being able to produce fruits for many years. For example, the Yuanjialing village of Gulai town in Shengzhou city has 1400 Torreya trees, but less than 40 male trees. High quality seed resources are being threatened, and because the ancient Torreya trees in Kuaijishan are all over one hundred years old, quality seeds will continue to disappear along with natural selection, so the establishment of protection measures are very necessary.

4.1.4 Weak Consciousness of Agricultural Heritage Protection

The current protection work is still on the ecological protection level due to the lack of understanding of the heritage value of ancient Torreya, and there are no comprehensive protection measures in the Kuajishan Ancient Chinese Torreya Community. This lack of consciousness is mainly reflected by the disregard of the multi purposes of Chinese Torreya trees other than the economic values. The inheritance of Torreya-associated ecological culture is neglected, which fractures the collective memory and creates difficulties in building local cultural consciousness. Meanwhile, with rapid socioeconomic development and urbanization, agriculture heritage is facing double damage caused by humans and nature. Many young people seeking modern ways, are unwilling to engage in and learn about agricultural work especially Chinese Torreya management and production techniques, and are not enthusiastic about folk culture. It is possible that such agricultural heritage will be lost due to the lack of well qualified successors.

4.2 National Level

4.2.1 Impacts of Modern Agricultural Ideology and Technology

Driven by the economic benefits, modern technology impacts the traditional modes of agriculture production continuously. For example, farmers now use large quantities of fertilizers, pesticides, and herbicides to increase Chinese Torreya production. However, while improving the yield of Chinese Torreya, the quality of forest soil is greatly damaged, and at the same time, chemical fertilizers have led to the pollution of water bodies, threatening the ecological environment.

4.2.2 Long Waiting Period of Return on Investment

Chinese Torreya is a type of high production plant with long terms of economic return. But it usually requires high investment before production occurs, and this process can take over 15 years. Large amounts of commercial capital must be found by other industries, or otherwise, support for the continuous investment in the Torreya industry

cannot be maintained. The management focus of Chinese Torreya at the early stage is manpower, but because most Chinese Torreya cultivation bases are located in places lacking convenient transportation, businesses need to face the fact of labor shortages. Although some businesses have successfully developed a series of Chinese Torreya products, including Chinese Torreya crackers, oil capsules, cooking oil, wine, and others, the deep processing of Chinese Torreya is difficult to find on the market, and some deep processed products are not really worth their prices. Currently, dry Chinese Torreya fruit supplies cannot meet the market demand, leaving no excess Chinese Torreya fruits for deep processing.

4.3 International Level

International level threats mainly include the impacts of climate change on the production of ancient Chinese Torreya. Increasing occurrence of extreme weather, such as lightning strikes, typhoons, and blizzards, can damage the Kuaijishan Ancient Chinese Torreya Community: If struck by lightning, the growth trend of trees can be affected; if no appropriate actions are taken after a typhoon, fallen trees will easily die, and blizzards can overwhelm the branches, leading to severe decrease on the trees' yield. In addition, as Chinese Torreya becomes more well-known and more Chinese Torreya products are exported to foreign countries, it will certainly encounter competition and challenges from similar types of agricultural products around the world.

5. Practical considerations

5.1 Ongoing efforts to promote the GIAHS

(1) Initiated the declaration for globally important agricultural heritage: establishment of leadership groups and a number of declaration associated meetings; held training courses regarding agricultural heritage conservation; in-depth studies of other GIAHS candidates.

(2) Launched various types of promotional events: participated in various GIAHS

activities, including the Cultural Heritage International Forum held in Japan in 2011, and the "Chinese Agriculture Exhibition" hosted by the Ministry of Agriculture in 2012; entrusted CCTV-7 to film the program—"The Technological Secrets of Ancient Chinese Torreya in Shaoxing"; Hosted the Kuaijishan Ancient Torreya Forest Essay and Photography Competition in 2012.

(3) Launched basic surveys and research: carried out field investigations in the Kuaijishan region and retained the photos of every ancient Chinese Torreya tree and established protection archives; collected Chinese Torreya associated materials, such as legends, tales, folk songs, customs, handmade crafts, and cultural carriers etc.

(4) Established ancient Torreya grandis conservation area: the establishment of the Chinese Torreya National Forest of Zhuji, the Gulai Provincial Chinese Torreya Forest Park of Shengzhou, and the Jidongzhen Chinese Torreya Forest Park of Shaoxing County has provided scientific and legal protections for ancient Torreya.

(5) Initiated declarations for the establishment of heritage conservation units: major Chinese Torreya production areas have all been listed as provincial level heritage conservation units and heritage conservation units of the city of Shaoxing and were declared to the Bureau of Cultural Relics of Zhejiang province to be considered in becoming a national level cultural relic conservation unit.

(6) Implemented protection for geographical symbol productions and promotions for technology: in 2011, "Fengqiao" Chinese Torreya approved the protection; the grafting, shading, and male Torreya cultivation technologies are being widely promoted.

(7) Established policies to support Torreya industry development: the provincial government is driving Torreya industry's development through research, agriculture and forest sites, and establishing policies, and creating an ecological tourism industry to build the only "primitive Chinese Torreya museum" and "Chinese Torreya cultural guild" in China.

5.2 Potentials and opportunities for sustainability and management of the GIAHS

5.2.1 Development Potential

(1) Effectively improve agricultural structure adjustment and increase farmers' income

The price of Chinese Torreya has always been high due to resources shortage and high demand. After entering the 21th century, the market price of Chinese Torreya is between 120-200 Yuan per kg, and increasing, making its cultivation efficiency number one among all other nuts, and thus it is known as the "wealth tree" to local farmers. The Kuaijishan Ancient Chinese Torreya Community has become a golden passport to Shaoxing city's tourism industry. The development of tourism can drive the developments of the first, second, and third industries of Kuaijishan, changing the situation where the proportion of the first industry is too large. While providing higher income and efficiency, ancient Chinese Torreya has become an important resource for rural tourism.

(2) In-depth development of Chinese Torreya's unique qualities and multiple values

As the origin and main production area of Chinese Torreya in China, the Kuaijishan Ancient Chinese Torreya Community contains a relatively complete Torreya resource, and thus, it also has research values in subjects such as history, geography, and environmental sciences, etc. Torreya trees over one thousand years old still produce large quantities of fruits every year, providing quality products for healthy consumption. Plus, the beautiful landscape and special features of the Kuaijishan Ancient Chinese Torreya Community form a unique and rich tourism resource along with Kuaijishan's mountain and culture heritage.

(3) Effectively inherit and develop traditional Torreya agriculture

Through the GIAHS program, the agricultural culture of the Kuaijishan Ancient Chinese Torreya Community that reflects the harmonious development of humanity and nature and its biodiversity, created by the people of Kuaijishan, can be protected.

The production mode, folk culture and continuous creativity over a thousand years formed by the Torreya culture in Kuaijishan can be retained. While protecting ancient Torreya forests, the program can also provide better land use methods, so this good land use system can continue to serve the people. The continuous enrichment of Chinese Torreya resources can ensure that Torreya culture will be passed on to later generations.

5.2.2 Development Opportunity

(1) The inheritance and development of traditional agriculture has become the focus of attention in both China and the whole world.

The safety of the ecological environment has become the main factor that influences human survival and development, and has received high levels of concern. Over the past 30 years, as western modern practices, such as the increasing use of chemical fertilizers and pesticides, intervenes, the soils in the mountain area have encountered a series of problems, including ground hardening, low soil fertility, pH imbalance, and excessive toxic substances. When faced with the environmental issues caused by industrialization, people are beginning to rethink the relationship between modern agriculture and traditional agriculture and attempt to absorb the survival and development wisdoms of traditional agriculture to overcome the negative impacts of modernization and rediscover the values of traditional agriculture. Therefore, the inheritance and development of traditional agriculture has become the center of attention.

(2) The rapid development of ecological tourism is a historical opportunity for the development of Torreya culture

As a way to emphasize the harmonious unification of humanity and nature, ecological tourism is showing good momentum in China in recent years. Because of its huge inclusivity and resources diversity, ecological tourism can easily aggregate with relevant industries and form a long industrial chain between upstream and downstream industries. The ancient Torreya forest in Kuaijishan offers the ‘trees of

wealth' and excellent ornamental tree species, and it is also a high grade monopolistic tourist resource. Many scholars and writers have written about Kuaijishan's Torreya, and there are many Torreya associated legends and stories about historical celebrities. Studies on the cultural values of Torreya in Kuaijishan during recent years have given high evaluations to the cultural and artistic values of the Kuaijishan Ancient Chinese Torreya Community. Based on the deep culture of Chinese Torreya, developing ecological tourism is an excellent opportunity to promote Torreya culture.

(3) Governmental concerns on ancient Torreya conservation and the development of Torreya industry

The GIAHS program is currently in full swing. The GIAHS program has received global recognition and has selected 19 agricultural systems in 11 countries around the world as conservation sites. In March of 2012, the Ministry of Agriculture officially declared the exploration works of agricultural heritage in China, which planned on discovering and determining a group of important agricultural heritage conservation sites every two years. The Kuaijishan mountain area in Shaoxing is the origin and main production area of Chinese Torreya. Because of its long history, profound culture, unique values, and old grafting technique, the Kuaijishan Ancient Chinese Torreya Community is an important agricultural heritage. The city government of Shaoxing has launched the declaration work of the Kuaijishan Ancient Chinese Torreya Community to the GIAHS program.

5.3 Expected impacts of GIAHS on society and ecology

5.3.1 Social impacts

With the development of ecological civilization, the contradiction between the dependency of mountainous area farmers on limited land resources and ecological protection has become increasingly prominent. How to achieve the harmonious development of man and nature in areas of limited land supply becomes a problem. It becomes a problem of sustainability. The systematic protection of the Kuaijishan

Ancient Chinese Torreya Community can not only protect this valuable genetic resource, but also improve the prominence of this system, promote tourism and the socio-economic development in Shaoxing, while achieving the harmonious development between man and nature. Torreya is very important in the sustainable development of Shaoxing City. The comprehensive and sustainable development of the Torreya grandis industry can be achieved by choosing green forest products, such as Chinese Torreys, tea, and fruit, as the leading industry, and strengthening the protection of the ecological environment and the environmentally sensitive construction of eco-villages.

5.3.2 Ecological impacts

The traditional management of Chinese Torreya has demonstrated advantages in adapting to climate change, supplying ecosystem services, protecting the environment, while providing a variety of products. The Kuaijishan Ancient Chinese Torreya Community is a particular mode of production and is characterized by land use patterns formed by the farmers' long-term adaptation to local natural conditions. From the traditional experience of farming, farmers achieve a true sense of how people can live in harmony on a day to day basis. This provides a valid and positive reference for other similar regions using land carefully and developing ways to adapt to ever-changing local conditions. With the accelerating process of industrialization, environmental problems have become more apparent in China. These environmental problems not only present dense concentrations of population and industry in cities, but are also spreading to the rural areas of China. The GIAHS initiative emphasizes the protection of traditional agriculture and associated biological and cultural diversity, thereby playing a positive role in the protection of the rural environment and providing a new opportunity to solve environmental problems in rural areas.

5.4 Motivation of the local community, the local/national authorities and other relevant stakeholders

5.4.1 Local communities

The Kuaijishan Ancient Chinese Torreya Community is the main livelihood source, the basis of culture and habitat for local communities. Community residents are positive and active to protect the Torreya group. The main motivations are: (1) the protection of Torreya may increase the sales price, and then improve their economic incomes and life quality; (2) the Kuaijishan Ancient Chinese Torreya Community can be sustained with the help of the GIAHS project. Especially older farmers have deep affection for the Chinese Torreya trees; (3) Protection of ancient Torreya grandis can enhance the cultural pride and identity of local farmers and their communities.

5.4.2 People's Government of Shaoxing City

Shaoxing local government will lead the protection and further development of Torreya on a high level. First, they want to protect this ancient, precious traditional agricultural mode from urban development and to retain this priceless heritage for future generations. Second, they hope to enhance the residents' awareness of the unique value of Torreya culture and improve the city's image and quality of life by strengthening the protection of the ancient Torreya forest. Thirdly, they hope to achieve a high-end Torreya brand with the GIAHS designation, and establish an organic industry chain with the core of ancient Torreya protected areas. This will improve Shaoxing ancient Torreya economic efficiency, and increase residents' income. Fourth, they want to develop the ancient Torreya landscape tourism in a modest way, by developing a thematic eco-tourism with sightseeing, leisure, vacations, and shopping based on a protected agricultural heritage. They wish to enable the city to not only produce high-quality Chinese Torreya, but also to promote the development of other related industries, while improving the urban culture and economic strength.

5.4.3 National government

The Kuaijishan Ancient Chinese Torreya Community has a long history. It's a typical traditional mode of agricultural production with a high cultural and economic value. The national government offers substantial support for three reasons: First, they save this high value historical agricultural heritage site for China. Second, they set an example to lead other agricultural ecosystem protection initiatives. Third, the positive influence of GIAHS can promote regional cooperation; give full play to ancient Torreya economic and ecological benefits, and to promote agro-ecological sustainable development.

5.4.4 Related enterprises

Many related enterprises hope to benefit from the effectiveness of a GIAHS designation which gives more value to ancient Torreya, so as to enhance the value and visibility of their own businesses, increase efficiency, and to seek long-term development for the enterprise.

5.4.5 Visitors

For the love of ancient Torreya grandis forest, visitors expect the historic Kuaijishan's ancient Torreya forest to be preserved. The main motivation is to be able to enjoy this unique and pleasant landscape, taste crispy and delicious Torreya and feel its old atmosphere. It is part of the great heritage of China.

6. Dynamic Conservation Plan for GIAHS Selected Site

6.1 Baseline description

6.1.1 Some conservation and development activities have been done

The declaration for globally important agricultural heritage has been initiated. We have established the leadership groups for heritage declaration and convened a number of declaration associated meetings; held training courses regarding agricultural heritage conservation; studied carefully and borrowed ideas from the

experiences of other GIAHS sites and candidates. We have also carried out field investigations in the Kuaijishan region; retained the photos of every ancient Torreya tree and established protection archives; collected Torreya associated materials, such as legends, tales, folk songs, customs, handmade crafts, and cultural relics. We have also established an ancient Torreya grandis flora conservation area and initiated declarations for the establishment of heritage conservation units. The technology has been installed for the geographical symbols that will protect the integrity and promote the image of the GIAHS. For "Fengqiao" Chinese Torreya, the protection of geographical symbol productions was approved in 2011; the grafting, shading, and male Torreya cultivation technologies are being widely promoted. The government is driving Torreya industry development through scientific research, agriculture and forest sites, and establishing protection and use policies; it is actively creating an ecological tourism industry to build the only "primitive Chinese Torreya museum" and "Chinese Torreya cultural guild" in China. We have participated in various agricultural heritage activities including the Cultural Heritage International Forum held in Japan in 2011, and the "Chinese Agriculture Exhibition" hosted by the Ministry of Agriculture in 2012; engaged the CCTV-7 to film the program "The Technological Secrets of Ancient Chinese Torreya in Shaoxing"; hosted the Kuaijishan Ancient Torreya Forest Essay and Photography Competitions.

6.1.2 Principles for the dynamic conservation plans were set up

(1) The principle of people oriented, public participation

"People oriented" is the dominant principle of agricultural heritage management, which can mobilize people to actively participate in agricultural heritage protection.

(2) The principle of overall planning, system protection

Governments at all levels should plan and protect the local agricultural heritage as a whole system to improve the overall effectiveness of protection.

(3) The principle of step-by-step implementation, long-term adherence

Because of large number of departments, complicated contents, wide coverage, and arduous tasks involved in agricultural heritage protection, and needing large financial, material and human resources, it is very difficult for protection work to make significant breakthroughs in the short term. Then we must have the advanced ideas and projected actions for long-term adherence.

(4) The principle of emphasis on development, mutual promotion

Agricultural heritage protection should be combined with the development of the local political, economic, cultural, scientific and technological spheres.

6.1.3 The multiple values of the Kuaijishan Ancient Chinese Torreya Community have been studied

Agricultural system of Kuaijishan ancient Torreya grandis flora is a unique mode of production and land use pattern that has been formed through long-term adaptation to local natural conditions by many generations of ancestors. This farming pattern created over time from the traditional experiences of farmers is a natural life style which is in harmony with nature, and achieves a true sense of the harmony among heaven, earth and humans. It also provides valid references for using the land rationally in other similar areas and developing the life style adapted to local conditions.

Kuaijishan ancient Torreya grandis flora resources not only have economic value, which are the important resources for tourism and can promote the sustainable development of the local economy, but also have great ecological value. The Torreya ecology and the related agriculture system are good for water and soil maintenance, water conservation, and biodiversity protection. At the same time, these resources also have the cultural values inherited from Torreya origins and Torreya cultural development. Dynamic protection of ancient Torreya grandis flora resources as an agricultural heritage is not only good for protection and rational utilization of resources, but also can promote the coordinated development of the local economy, environment and culture.

6.1.4 The current system of the Kuaijishan Ancient Chinese Torreya Community has been analyzed

Kuaijishan is the original, key production and centralized distribution region of Chinese Torreya, and is also the natural preservation center of Torreya planting resources in China. Because Kuaijishan ancient Torreya grandis flora has gone through the wind and rain for hundreds of years, some ancient Torreya have aged well. In addition, the damage from lightning strikes, typhoons and pests etc. are very common. To protect this important agricultural heritage, intensive protection measures for ancient Torreya grandis flora have to be taken. The establishment of Dongbaishan Provincial Nature Reserve in 2003, which is the first Nature Reserve in Zhejiang focusing on economic species (Torreya) plant resource protection, 2 provincial nature reserves and 3 Shaoxing municipal nature reserves have provided scientific and legal protection for ancient Torreya. In 2011, "Fengqiao" Chinese Torreya was approved as the Geographical Identity Products.

6.1.5 Delimited functional areas of the GIAHS

Based on the characteristics of agricultural heritage and features of Kuaijishan ancient Torreya grandis flora resources, the scope of Kuaijishan ancient Torreya grandis flora agricultural heritage has been delimited. It is located at N29°25'-29°47', E 120°17'-120°38' and involves 12 villages and towns and 59 administrative villages in Shaoxing, with a total area of 402 km². Simultaneously, according to the relevant principles of conservation, the development reserves are divided into 8 partitions, which are respectively the resort region of ancient Torreya forest, Dongbai lake ecological tourism region, Sizhai ancient village protected region, Torreya history memorial region, Torreya planting demonstration region, Torreya grandis seedlings industrial region, Torreya planting resources protection region and ecological preservation region.

6.2 Planning activities for dynamic conservation of the system

6.2.1 Agro-ecological protection

A systemic and comprehensive, study needs to be undertaken to investigate agricultural biological diversity in the protection region and to carry out a general investigation of ancient Torreya resources and to build a resources file database on ancient Torreya . Rejuvenation measures for very ancient Torreya must be taken in a timely manner to ensure their continued growth. A planting resource pool is built, and Torreya seed is widely collected and stored for a long time in the planting resource pool. Effective biological control methods learned from the traditional modes of agricultural production must be used to replace pesticides for insect, disease and weed control, and that organic fertilizer and farmyard manure are used to replace fertilizer. Domestic waste is to be transported to a landfill site for disposal. If conditions allow, sewage from the township and villages in the protected region should enter the sewage treatment plant, and treated water can be used for irrigation, aquaculture and reuse after achieving the appropriate water quality standards set by centralized sewage treatment authorities. For sewage which cannot be transported to the sewage treatment plant, it should be discharged after treatments in an anaerobic tank, or biochemical pool, or methane tank.

6.2.2 Protection of agricultural culture

We need to investigate further the traditional farming culture, folk art, customs, proverbs, songs, poetry, and ancient buildings; tease out the history and changes of cultural resources to prepare for further protection and revitalization; and further strengthen the declaration work of cultural conservation units and intangible cultural heritage. We should enhance the promotion of Kuajijishan ancient Torreya agricultural culture and increase its popularity, and select the time of annual picking of Torreya to hold festivals. A Torreya Culture Research Center will be founded, and a detailed collation of Torreya traditional culture information is needed. We also need to hold

training courses regarding Torreya traditional culture. A Torreya culture museum will be built.

6.2.3 Agricultural landscape protection

We need to investigate the use status of land and buildings in detail in the protected region, and establish a comprehensive database of buildings and landscapes associated with Torreya, and finish the classification and evaluation of the use status. Special sections need to be established to monitor and supervise the changes of agricultural heritage site villages and landscape, and for preventing illegal or inappropriate construction. Historic buildings which need maintenance should be repaired uniformly, and modern buildings should be controlled severely. Repaired modern buildings need the appearance to restore the ancient ways for maintaining consistency with the overall image of the heritage sites. To promote the protection work of agricultural heritage from different aspects, we need to further strengthen the declaration works of traditional ancient villages.

6.2.4 The development of ecological products

The scope of the Torreya organic, green and pollution-free production base should be delimited, and various types of strict production standards and management methods developed. We should strongly promote these standards, and make the Torreya industry reliable by implementing standardized production. We should enhance supervision and management of brand quality, and eliminate some the unqualified trademarks, and build and support 10-15 of the leading companies and brands of Torreya products processing which have guaranteed quality and a good reputation. We should propagate all kinds of Torreya products from various aspects in the media such as TV, radio, newspapers and magazines, and actively participate in the various regional and national agricultural exhibitions and promotional activities, and strengthen various quality controls of local agricultural products.

6.2.5 The development of sustainable tourism

We should examine carefully the tourism opportunities of Kuajijishan ancient Torreya

grandis flora, and build a regional database of tourism resources. On the basis of the existing tourist routes, new tourist routes can be built by further considering features of agricultural heritage for sustainable tourism and the needs of tourists, such as meals, housing, transportation, shopping and entertainment. Tourism products are developed considering all levels of the tourism, vacation and scientific investigation. Traffic routes should form a coherent system in the heritage sites to connect in a series with each other between important attractions and tourist service areas. We must build appropriate parking based on the characteristics of scenic spots.

6.2.6 The promotion of cultural awareness capability

Contents of agricultural heritage are integrated into exhibitions and entrance ways of schools to develop local people's deep feelings and pride for Torreya. We will make video presentations which can be played in different occasions with different lengths of films, and publish books related the protection of ancient Torreya grandis flora agricultural heritage, and create prose, poetry, fiction and photography related the protection of Shaoxing Kuaijishan ancient Torreya grandis flora. While traditional media such as newspapers, radio and television is used for propaganda, plus digital-media such as social networks, micro-blogs and micro-movies, Shaoxing and Shaoxing Kuaijishan ancient Torreya grandis flora can be promoted. In addition, we can also participate in or hold or sponsor various academic, cultural and sports activities such as conferences and photography exhibitions and essay competitions based on the desired frequency of publicity

6.2.7 The promotion of participation in decision-making capability

The appropriate administrative agencies related to conservation and development of Kuaijishan ancient Torreya agricultural heritage will be established in the prefecture-level city government (Shaoxing) and county-level city government (Zhuji, Shaoxing County, Shengzhou). The rules and regulations related to community participation of Shaoxing agricultural heritage protection also should be improved, to ensure the seriousness and continuity of community participation implementation. We

will organize managers and farmer representatives of Kuaijishan ancient Torreya grandis flora agricultural heritage community to actively participate in various meetings, and study various advanced concepts and successful experiences of conservation and development of agricultural heritage, and apply these concepts and experiences to conservation and development of local Torreya resources. We will establish the technical organizations of local ecological monitoring to synthesize and coordinate ecological monitoring work across all departments and localities, and to monitor old trees resources, special ecological environments, biodiversity and alien species for long-term preservation. We will improve the administrative supervision system and strengthen the construction of the community self-management system. Through community self-management system, villagers' awareness of modern life can be improved continuously.

6.2.8 The promotion of management capability

We will establish a high level system of agricultural technology promotion and training, and plan for skills training of workers, to increase technology training of farmers in Torreya producing areas. We will promote and apply vigorously the relevant scientific research findings and new technology of forest management, and absorb, learn and apply the advanced technology of other sectors. We will establish the professional breeding center to provide high quality seedlings for protected regions and surrounding areas. The training of ecological agriculture technicians will be strengthened to establish a professional team which can protect agricultural heritage now and in the future. We will increase fund investments, and procure various funds to support key policies. We will strengthen the construction of the Torreya Association to give full impetus to bridging communication with other industry associations. We will encourage related enterprises and contractual management groups, and support farmers to improve land rotation systems on the basis of voluntary participation and mutual benefit, and support, train and develop several champion enterprises.

6.3 The strategy for threats and challenges

6.3.1 Regional level

(1) The strategy for external migration of working-age labor force

- i. Through training and meetings, to increase farmers' understanding of ancient Torreya values and opportunities for economic gain, and explore impacts of local cultures, and at the same time teach young people the methods and skills about Torreya business to ensure that they can plant and harvest Torreya;
- ii. Formulate related compensatory measures for farmers who plant Torreya to ensure the long term future of Torreya cultural heritage;
- iii. Hold tourist cultural activities to drive the protection and sustainable development of ancient Torreya, and to increase farmers' income and comparative effectiveness of Torreya business, and to decrease external migration of the labor force;
- iv. Establish a production base of organic Torreya, and formulate organic and green production standards of Torreya, to increase the quality and price of Torreya, to make the young labor force play a part in the modern management capability of the Torreya business;
- v. Restore Torreya cultural festival activities to promote local people's pride and feeling for Torreya, and to increase enthusiasm and initiative in learning about local culture and its protection, and to cultivate young people's feelings for Torreya.

(2) The strategy for Chinese Torreya growth threatened by natural disasters and pest invasion

- i. Establish protection mechanisms through multi-actor participation, and improve recognition by the government of agricultural heritage projects, to ensure the successful implementation of projects related to ancient Torreya conservation

and development;

- ii. Give full play to the important roles of the national, provincial and municipal agricultural sector for leadership and coordination of the project, and scientific research departments for providing scientific and technological support for the project, and local government for specific implementation of the project. Over time, the project will become a program:
- iii. Research the integrated control of Torreya pest and diseases, and hold various meetings and science popularization activities, to strengthen the promotion and increase the awareness of Torreya conservation practices;
- iv. Try hard to make all departments further recognize the important contribution of agricultural heritage to the agriculture and food sector in China and to ecological sustainable development, and the important functions of agricultural heritage during the establishment of the new socialist countryside.

(3) The strategy for weak consciousness of agricultural heritage protection

- i. Further develop folk habits of Shaoxing Kuaijishan ancient Torreya grandis flora to conservation and heritage of culture, because many legends, stories, blessing activities and sacrificial festivals associated with Torreya are circulated widely in the Kuaijishan area. To promote Torreya and its intangible cultural heritage as important parts of local people's daily life;
- ii. Make Kuaijishan ancient Torreya grandis flora agricultural heritage festivals become the region's important cultural festivals, and select the theme associated with blessings and sacrificial festivals of Torreya to enrich cultural awareness;
- iii. Establishment of exhibition rooms of agricultural heritage as key construction projects of agricultural heritage protection, the main context of which is history and development of ancient Torreya grandis flora and traditional agricultural life. To integrate also features of agricultural and national culture and apply many forms such as objects, pictures and images to show living ancient Torreya grandis

flora agricultural heritage.

(4) The strategy for the conflict of conservation and development

- i. When preserving culture we should maintain original contents and artifacts, as we can't change traditional culture at will to cater to today's cultural consumption demand.
- ii. Handle the relationship of agricultural tradition and modern innovation carefully: One can't stress cultural protection in excess, and be against modern utilitarianism and heritage, and against the development and utilization of cultural heritage indiscriminately; neither can we also stress cultural utilization in excess, and measure the achievement of development by economic indicators only, and exchange the achievement of sustainability by resource consumption;
- iii. Use advantages of ecological environment well, and study popular development models of eco-tourism in the world, and find the combination point of several levels including culture, history and development to solve the conflict between protection and utilization and to maintain a balance in the future:
- iv. Develop and utilize the important agricultural heritage as important historical and cultural resources which together with landscape resources can enrich leisure agriculture, and enhance the potential of product development to increase farmers' income in the heritage site.

6.3.2 National level

(1) The strategy for impacts of modern agricultural ideology and technology

- i. Decrease the amount of fertilizer and use organic fertilizers based on the principles of scientific, reasonable and demand fertilization; use reasonably pesticide and decrease hazards of pesticide residue based on national standards of "Guidelines for the safe application of pesticides";
- ii. Establish environmental impact assessment systems of alien species, and strengthen the supervision of alien species introduction;

- iii. A unit or an individual who wants to import animals and plants which do not exist in the local ecological environment of the site should submit applications to relevant competent departments, and complete relevant examination and approval procedures of entry; at the same time these animals and plants can be imported only after scientific risk assessment by relevant experts and testing organizations have shown that they are harmless.
- iv. Introduction of species which are included in the national list of invasive species are prohibited.

(2) The strategy for long waiting period before a return on investment

- i. Suggest all levels of government in Shaoxing provide agricultural heritage protection with suitable preferential policies, for example providing an agricultural heritage special protection fund, and the development of agricultural heritage tourism and organic agriculture with policy support, and residents' living and production in the agricultural heritage demonstration region with policy and economic support;
- ii. Establish unified production and processing quality standards by package design and trademark registration to enhance the Torreya product quality and market competitiveness; purchase the stir fried products by farmers and make sales after unified packaging, which can increase farmers' income, and also can strengthen and promote the local brand of Torreya;
- iii. Develop various derivative products of Torreya by scientific and technical innovation, and extend the industry chain of Torreya, and increase added value of Torreya; eventually expanding sales of Torreya, that will increase farmers' income in the mountain areas.

6.3.3 International level

Strategy:

- i. Suggest installing lightning conductors in the region of Torreya concentration to

protect ancient Torreya trees and farmers' interests; Torreya which are sometimes overwhelmed by big snowfall should be righted, and steadied by earthing up, and sustained by bamboo and wood;

- ii. Join GIAHS, and form an association with others GIAHS sites, and learn about their successful experiences, and enhance the influence of ancient Torreya agricultural heritage at the international level.

6.4 How to use and obtain protection funds

6.4.1 Widening the channel of fund-raising

Government in the heritage site will widen the sources of funds, and establish multi-channel fund raising methods, to obtain ample protection funds and to promote the protection of agricultural heritage. We can obtain financial support through supportive policy for special products in the national agricultural policy; can set up a special fund for agricultural heritage conservation and development from local governments; can raise social funds from different sources, for example funds from businesses and individuals benefiting from GIAHS. In addition, ecological compensation has an important role for agricultural heritage protection, and will compensate farmers who lose income while protecting heritage by reasonable means and money. Government may provide subsidies for related industries, such as organic agriculture and tourism

6.4.2 Utilization of funds

We can increase appropriately the proportion of supportive funds which can be used for construction of major projects, for example establishment of agricultural infrastructure and improving agricultural production conditions; strengthen financial support which is used for ecological compensation for ecological protection; allocate reasonable funds for meetings and other promotional activities; and ensure adequate funds of scientific research.

6.4.3 Supervision and inspection

Relevant departments need to carry out supervision and inspection for the management and usage of funds, to ensure safe, reasonable and effective investments. The contents of supervision and inspection include a) checking management and use of major project funds during the year; b) checking the operation of project implementation tasks and Responsibility Contract of Engineering Quality, and if relevant, help departments take their respective responsibilities seriously based on stipulations in the Responsibility Contract to ensure progress and quality control; c) checking operation of rectification measures, and urging local governments and relevant departments to solve the major illegal problems that have not been corrected and handled properly; d) investigating and punishing the activities of those violating the law and disciplining them. In addition, we should strengthen the monitoring of the ecological environment to ensure rational use of funds and smoothness of ecological compensation

6.5 Establishment of different organizational system levels

6.5.1 National level

Our country provides a good policy environment and funding support for local agricultural heritage protection. Relevant departments such as the Ministry of Agriculture also give full attention and support for the declaration of agricultural heritage. In future, we should strengthen continuously the establishment of macro-organizational regulation and management departments, and support, guide and promote agricultural heritage protection for successful long term outcomes.

6.5.2 Establishment of city, county and township organization

Enhancement of city organizations has great significance for agricultural heritage protection. A committee of agricultural heritage protection should be established in Shaoxing, to be managed by municipal leaders. Responsibilities of the committee are to ensure successful implementation of agricultural heritage protection projects, and

be responsible for management and implementation of research projects. An executive office is established under the committee, which is fully responsible for implementation of the committee's work, should have a place in the Municipal Bureau of Agriculture for working easily. County and township governments will set up appropriate institutions and look for qualified people to work there.

6.5.3 Establishment of village organization

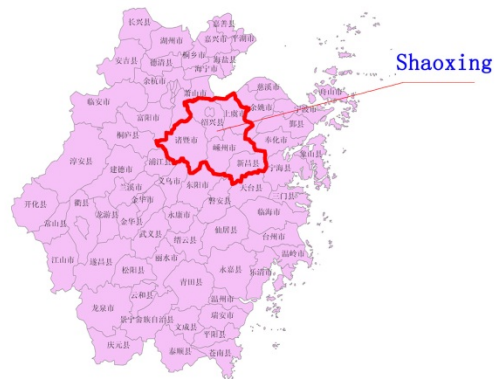
Farmers are the main body responsible for agricultural heritage protection. We should establish a protection agency which is constituted mainly of farmers to ensure successful protection activities. We also need to establish a village committee, participated in by villagers, village cadres and village enterprises, and improve villagers' capacity for protection work, and to carry out community co-management and ensure that agricultural heritage can be protected successfully.

Appendix I: Maps

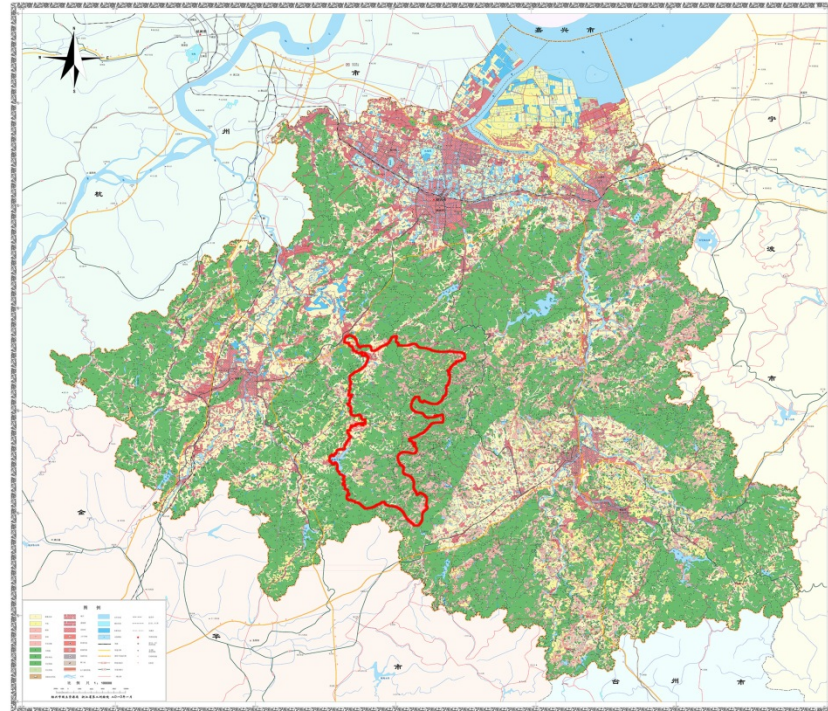
1. Location map of the Kuaijishan Ancient Chinese Torreya Community



Zhejiang province in China

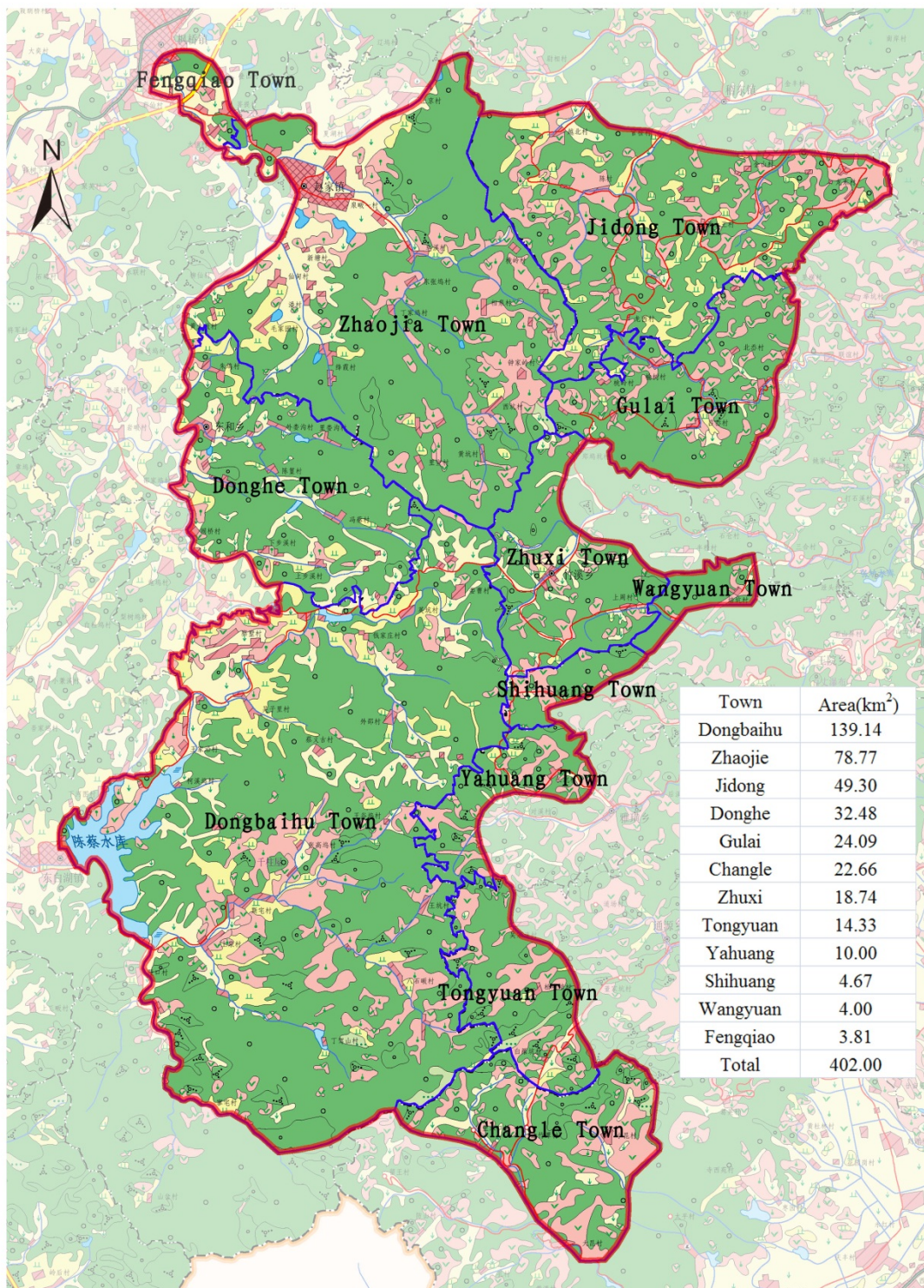


Shaoxing in Zhejiang province



Location of Shaoxing *Torreya grandis* cv. *Merrillii* Community

2. Boundary of the Kuaijishan Ancient Chinese Torreya Community



Appendix II: Agricultural and associated biodiversity

1. The species and distribution status of *Torreya* genus plants

Species	Types	Distribution regions	Resource status	Remarks
<i>Torreya taxifolia</i>		Southeastern Georgia and Florida, USA		Seeds inedible
<i>Torreya californica</i>		Central California and northwestern Nevada, USA		Seeds inedible
<i>Torreya nucifera</i>		Japan, Korea and China have introduction		Seeds edible but quality is poor
<i>Torreya fargesii</i> var. <i>yunnanensis</i>		Northwestern Yunnan province and northern Burma	Scattered in the valley or hillside coniferous forest and mixed wood which the latitude is from 2000 to 3400 meters. Resource is scarce.	The seed endosperm is deeply wrinkled, shelling is difficult, and the kernel is inedible.
<i>Torreya fargesii</i>		Hubei, Sichuan, Chongqing, Henan and southern Anhui	The main growth is wild and sporadic, 5000 MU of artificial cultivation in Tongshan County, Hubei Province.	
<i>Torreya jackii</i>		Southern Zhejiang, northern Fujian and eastern Jiangxi	The altitude of distribution is from 250 to 900 meters. The area of <i>Torreya jackii</i> in Zhejiang is 2581.6 hectare, the total amount is 634 thousand strains (clumps). The Jiuchi village in Wudao Gorge Natural Reserve in Baokang County has 1000 MU of <i>Torreya jackii</i> , and 15000 strains.	
<i>Torreya grandis</i> var. <i>jiulongshanensis</i>		Jiulong Mountain, Suichang County, Zhejiang Province	Scarce resources	Seeds inedible
<i>Torreya grandis</i>	Torreya <i>grandis</i> is an improved variety for grafting propagation	The origin is Kuaiji Mountains (Zhuji, Shengzhou, Dongyang, Shaoxing County, Panan), a large amount of diffusion is going	By the statistics, the whole province has 105 thousand strains in 2006, 45 thousand strains in Zhuji, 28.3 thousand strains in Shengzhou, 17 thousand	Seeds edible and quality is good

		on in Lishui, Hangzhou and other cities and Jiangxi, Anhui and other provinces in recent years.	strains in Shaoxing County, 10 thousand in Dongyang and 3.9 thousand strains in Panan. In the beginning it produced saplings of 58 thousand strains. The yield is also similar to this proportion.	
	Seedling stand variation type, including fine <i>Torreya</i> , tusks <i>Torreya</i> , large round <i>Torreya</i> , mid round <i>Torreya</i> , small round <i>Torreya</i> , etc.	Originated in Zhejiang, Jiangxi, Jiangsu, Anhui, Hunan, Hubei, Fujian, Chongqing, Sichuan, Guizhou, Yunnan and other provinces in central and eastern China. The central producing area is Zhejiang, Jiangxi, Hunan, Jiangsu, Anhui and Fujian in east China.	counties in the whole province which has the largest number of big <i>Torreya grandis</i> trees in 2003 - 2004 as follows. 403.6 thousand strains in Linan, 13.5 thousand strains in Anji, 12.2 thousand strains in Qingyuan, 5.6 thousand in Songyang, 5 thousand strains in Zhuji, 4 thousand strains in Shaoxing County, 3.1 thousand strains in Fuyang, 3 thousand strains in Shengzhou, 2.3 thousand strains in Jiande and 2.1 thousand strains in Chunan.	

2. Agricultural biodiversity

Category		Namespace of variety		Region	Remarks
Rice	Indica	Viscous	Jinzaao 47	Shengzhou, Zhuji, Shaoxing	Introduced
	Indica	Viscous	Zhongzao 22	Zhuji, Shaoxing	Introduced
	Indica	Viscous	Zhongjiazao 32	Zhuji	Introduced
	Indica	Viscous	Zhenong 34	Zhuji	Introduced
	Indica	Viscous	Zhongzao 39	Shengzhou, Zhuji	Introduced
	Indica	Viscous	Liangyoupeijiu	Shengzhou, Zhuji, Shaoxing	Introduced
	Indica	Viscous	Zhongzheyao 8	Shengzhou, Zhuji, Shaoxing	Introduced
	Indica	Viscous	Fengliangyouxiang 1	Shengzhou, Zhuji	Introduced
	Indica	Viscous	Qianyou 1	Shengzhou	Introduced
	Japonica	Viscous	Xiushui 09	Shengzhou, Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Ning 88	Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Xiushui 114	Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Xiushui 134	Shengzhou, Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Jiayou 2	Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Xiuyou 5	Shengzhou, Shaoxing	Introduced
	Japonica	Viscous	Yongyou 8	Shengzhou, Zhuji, Shaoxing	Introduced
	Japonica	Viscous	Yongyou 9	Shengzhou, Zhuji	Introduced
	Japonica	Viscous	Yongyou 12	Shengzhou, Zhuji, Shaoxing	Introduced
	Japonica	Waxy	Shaonuo 9714	Shengzhou, Zhuji, Shaoxing	Introduced
	Japonica	Waxy	Xianghu 13	Shengzhou, Zhuji, Shaoxing	Introduced
Japonica	Waxy	Jia 65	Zhuji	Introduced	
Japonica	Waxy	Yongyou 10	Shengzhou, Zhuji, Shaoxing	Introduced	
Sweet potato			Red rind white pulpsweet	Zhuji	Traditional
			Mountain sweet potato	Zhuji	Traditional
			Xushu 18	Shengzhou, Zhuji, Shaoxing	Introduced
			Zheshu 13	Zhuji, Shaoxing	Introduced
			Shengli 100	Zhuji	Introduced
			Zheshu 132	Zhuji, Shaoxing	Introduced
Wheat			Rohdea japonica	Zhuji	Traditional
			Foreign wheat	Zhuji	Traditional
			Yangmai 12	Shengzhou, Shaoxing	Introduced
			Yangmai 158	Shengzhou, Zhuji, Shaoxing	Introduced
Corn			White corn	Shaoxing	Traditional
			Danyu 13	Shengzhou, Zhuji, Shaoxing	Introduced
			Nongda 108	Shengzhou, Zhuji, Shaoxing	Introduced

Category		Namespace of variety	Region	Remarks
		Suyunuo 1	Shengzhou, Zhuji, Shaoxing	Introduced
		Suyunuo 2	Shengzhou, Zhuji, Shaoxing	Introduced
		Zhifengnuo 2	Shengzhou, Shaoxing	Introduced
		Zhenuoyu 1	Shaoxing	Introduced
		Dushiliren	Shengzhou, Zhuji	Introduced
		Zhetian 2018	Zhuji, Shaoxing	Introduced
		Chaotian 3	Shengzhou, Zhuji	Introduced
		Zhetian 6	Shengzhou	Introduced
		Chaotian 204	Zhuji	Introduced
		Zhifengtian 2	Shaoxing	Introduced
Mulberry		Heyebai	Zhaojia Town, Gulai Town, Jidong Town	
		Tuantouheyebai	Zhaojia Town, Gulai Town	
		Tongxiangqing	Zhaojia Town, Gulai Town, Jidong Town	
		Husang 197	Zhaojia Town, Gulai Town, Jidong Town	
		Huangsang 14	Zhaojia Town, Gulai Town	
		Nongsang 12	Jidong Town	
		Nongsang 8	Jidong Town	
Silkworm		Qiufeng ×baiyu	Zhaojia Town, Jidong Town	
		Baiyu ×qiufeng	Gulai Town	
		Qingsong ×haoyue	Jidong Town	
Tea plant	Gamogenesis	Local colony variety	Zhaojia Town, Gulai Town, Jidong Town	
		Jiukang variety	Zhaojia Town, Gulai Town, Jidong Town	
		Fuding big white tea	Zhaojia Town, Gulai Town, Jidong Town	
	Clone	Wuniuzao	Zhaojia Town, Gulai Town, Jidong Town	
		Yingshuang	Zhaojia Town, Gulai Town, Jidong Town	
		Longjing 43	Zhaojia Town, Gulai Town, Jidong Town	
		Zhenong 139	Zhaojia Town, Gulai Town, Jidong Town	
		Zhenong 117	Zhaojia Town, Gulai Town, Jidong Town	
		Zhenong 113	Zhaojia Town, Gulai Town, Jidong Town	
Longjing longleaf	Zhaojia Town, Gulai Town, Jidong Town			
Anji white tea	Zhaojia Town, Gulai Town, Jidong Town			
Vegetables	Pumpkin	Mapi pumpkin	Zhaojia Town, Jidong Town	Traditional
		Shijiemei pumpkin	Zhaojia Town, Jidong Town	Traditional
		Jingli	Jidong Town	Introduced
		Shinong	Zhaojia Town, Jidong Town	Introduced

Category		Namespace of variety	Region	Remarks
	Bottle gourd	Niutuiipu	Jidong Town	Traditional
		Yao gourd	Jidong Town	Traditional
		Zhepu 2	Jidong Town	Introduced
	Wax gourd	White rind big wax gourd	Zhaojia Town, Jidong Town	Traditional
	Towel gourd	Chunsi 1	Jidong Town	Introduced
		Middle towel gourd	Zhaojia Town	Introduced
	Cucumber	Jinyou 1	Zhaojia Town, Jidong Town	Introduced
	Kidney bean	Red flower black seed	Jidong Town	Traditional
		Shaoxing white seed kidney	Jidong Town	Traditional
		American sword bean	Gulai Town	Introduced
	Cowpea	Non-shack cowpea	Jidong Town	Traditional
		Zhijiang 28-2	Gulai Town, Jidong Town	Introduced
	Green soy bean	Qi Ba Jiu Yue Ba	Zhaojia Town, Jidong Town	Traditional
		Tai 75	Zhaojia Town, Gulai Town, Jidong Town	Introduced
	Celery cabbage	Aihaungtou	Jidong Town	Traditional
	Pakchoi	Zaoshu 5	Gulai Town, Jidong Town	Introduced
		Suzhou qing	Gulai Town, Jidong Town	Introduced
	Chinese cabbage	Gaojiaobai	Zhaojia Town, Jidong Town	Traditional
		Youdonger	Jidong Town	Traditional
	Leaf mustard	Jiuxin mustard	Zhaojia Town, Gulai Town, Jidong Town	Traditional
		Big leaf mustard	Zhaojia Town	Traditional
	Edible amaranth	White edible amaranth	Zhaojia Town, Jidong Town	Traditional
		Red edible amaranth	Zhaojia Town	Traditional
Radish	Emilia sonchifolia	Zhaojia Town, Jidong Town	Traditional	
Shallot	Shengzhou four seasons	Gulai Town	Traditional	
Taro	Red peduncle taro	Zhaojia Town, Jidong Town	Traditional	
Tomato	Jinzhū small tomato	Jidong Town	Introduced	
Hot pepper	Hangjiao 1	Jidong Town	Introduced	
Eggplant	Hangqie 1	Jidong Town	Introduced	
Fruits	Green plum		Zhaojia Town, Gulai Town, Jidong Town	
	Cherry		Zhaojia Town, Gulai Town, Jidong Town	
	Honey peach		Zhaojia Town, Gulai Town, Jidong Town	
	Yellow peach		Zhaojia Town, Gulai Town, Jidong Town	
	Red bayberry		Zhaojia Town, Gulai Town, Jidong Town	
	Plum		Zhaojia Town, Gulai Town, Jidong Town	
	Loquat		Zhaojia Town, Gulai Town, Jidong Town	

Category		Namespace of variety	Region	Remarks	
	Mulberry				
	Citrus		Zhaojia Town, Gulai Town, Jidong Town		
	Grape			Introduced	
	Pear		Zhaojia Town, Gulai Town, Jidong Town		
	Jujube		Zhaojia Town, Gulai Town, Jidong Town		
	Yangtao		Zhaojia Town, Gulai Town, Jidong Town		
	Apricot		Zhaojia Town, Gulai Town, Jidong Town		
Beasts and birds		Landrace			
		large white			
		Duroc			
		Jinhua swine			
		Jiaxing black swine			
	Cattle		Cattle		Traditional
			Buffalo		Traditional
	Sheep		Whit goat		Traditional
	Chicken		Guangxi sanhuang chicken		Introduced
			Zhenning yellow chicken		Bred
			Xianju chicken		Bred
	Duck		Shaoxing duck		Traditional
			Muscovy duck		Introduced
			Wild duck		Traditional
	Goose		Zhedong white goose		Traditional
Hare		Rex rabbit		Introduced	
Pigeon		American kingpigeon		Introduced	
Bee		Apis mellifera		Introduced	

3. Plants in Kuaijishan Ancient Chinese Torreya Community

PTERIDOPYTA

Huperziaceae

Phlegmariurus mingchegensis Ching

Lycopodiaceae

Lycopodium japonicum Thunb.

Palhinhaea cernua (Linn.) Francoet Vasc.

Selaginellaceae

Selaginella braunii Bak.

Selaginella moellendorffii Hieron.

Selaginella tamariscina (Beauv.) Spring

Equisetaceae

Equisetum arvense Linn.

Hippochaete ramosissima (Desf.) Boerner

Botrychiaceae

Scepteridium ternatum (Thunb.) Lyon

Osmundaceae

Osmunda japonica Thunb.

Lygidiaceae

Lygodium japonicum (Thunb.) Sw.

Gleicheniaceae

Dicranopteris pedata (Houtt.) Nakaïke

Lindsaeaceae

Sphenomeris chinensis (Linn.) Maxon

Pteridiaceae

Pteridium aquilinum (Linn.) Kuhn

var. *latiusculum* (Desv.) Underw.

Pteridaceae

Pteris cretica L. var. *nervosa* (Thunb.)

Pteris multifida Poir.

Sinopteridaceae

Onychium japonicum (Thunb.) Kunze

Adiantaceae

Adiantum capillus-veneris Linn.

Hemionitidaceae

Coniogramme japonica (Thunb.) Diels

Athyriaceae

Athyriopsis japonica (Thunb.) Ching

Athyrium niponicum (Mett.) Hance

Diplazium crassiusculum Ching

Parkeriaceae

Ceratopteris thalictroides (L.) Brong

Aspleniaceae

Asplenium trichomanes L.

Thelypteridaceae

Cyclosorus acuminatus (Houtt.) Nakai

Macrothelypteris oligophlebia (Bak.) Ching

Phegopteris decursive-pinnata (van Hall.) F'ee

Blechnaceae

Woodwardia japonica (Linn.f.) Smith

Dryopteridaceae

Arachniodes rhomboidea (Wall. Ex. Mett.) Ching

Cyrtomium fortunei J.Sm.

Dryopteris championii (Benth.) C.Chr.ex Ching

Drynariaceae

Drynaria fortunei (Kunze) J.Sm.

Polypodiaceae

leporus asterolcpis (Bak.) Ching

Lepidogrammitis drymoglossoides (Bak.) Ching

Microsorium henryi (Christ) Kuo

Phymatopsis hastate (Thunb.) Kitag.

Rhizoma Polypodioidis Nipponicae

Pyrrosia lingua (Thunb.) Farwell

Saxiglossum angustissimum (Gies.) Ching

Marsileaceae

Marsilea quadrifolia Linn.

Salviniaceae

Salvinia natans (Linn.) All.

Azollaceae

Azolla imbricata (Roxb.) Nakai

GYMNOSPERMAE

Ginkgoaceae

Ginkgo biloba Linn.

Pinaceae

Cedrus deodara (Roxb.) G. Don

Pinus massoniana Lamb.

Pinus taiwanensis Hayata.

Pinus taeda Linn.

Pseudolarix kaempferi (Lindl.) Gord.

Taxodiaceae

Cryptomeria fortunei Hooibrenk ex Otto et Dietr.

Cunninghamia lanceolata (Lamb.) Hook.

Metasequoia glyptostroboides Hu et Cheng

Cupressaceae

Chamaecyparis obtusa (Sieb. Et Zucc.) Endl.

Chamaecyparis pisifera (Sieb. et Zucc.) Endl.

Cupressus funebris Endl.

Platycladus orientalis (L.) Franco

Sbina chinensis (Linn.) Ant.

Juniperus formosana Hayata.

Podocarpaceae

Podocarpus macrophyllus (Thunb.) D. Don

Cephalotaxaceae

Cephalotaxus fortunei Hook. f.

Taxaceae

Torreya grandis Fort. ex Lindl.

ANGIOSPERMAE

Saururaceae

Hottuynia cordata Thunb.

Piperaceae

Piper hancei Maxim.

Chloranthaceae

Chloranthus fortunei (A. Gray) Solms-laub.

Chloranthus henryi Hemsl.

Chloranthus serratus (Thunb.) Roem. et Schult.

Salicaceae

Populus adenopoda Maxim.

Salix babylonica L.

Salix rosthornii Seem.

Myricaceae

Myrica rubra (Lour.) Sieb. et Zucc.

Juglandaceae

Cyclocarya paliurus (Batal.) Iljinskaja

Platycarya strobilacea Sieb. et Zucc.

Pterocarya stenoptera C. DC.

Brtulaceae

Alnus trabeculosa Hand.-Mazz.

Carpinus londoniana H. Winkl.

Carpinus viminea Wall.

Fagaceae

Castanea henryi Rehd. et Wils.

Castanea mollissima Bl.

Castanea sequinii Dode

Castanopsis carlesii (Hemsl.) Hayata

Castanopsis eyrei (Champ. ex Benth.) Tutch.

Castanopsis fargesii Franch.

Castanopsis jucunda Hance

Castanopsis sclerophylla (Lindl.) Schettky

Castanopsis tibetana Hance

Cyclobalanopsis glauca (Thunb.) Oerst.

Cyclobalanopsis myrsinaefolia (Bl.) Oerst.

Cyclobalanopsis nubium (Hand.-Mazz.) Chun

Cyclobalanopsis myrsinaefolia (Bl.) Oerst.

Cyclobalanopsis stewardiana (A. Camus) Y. C.

Hsu et H. W. Jen

Lithocarpus brevicaudatus (Hance) Hayata

Lithocarpus cleistocarpus (Seem.) Rehd. et

Wils.

Lithocarpus glaber (Thunb.) Makai

Quercus acutissima Carr.

Quercus aliena Bl.

Quercus fabri Hance

Quercus glandulifera Bl. var. *brevipetiolata*

(A. DC.) Nakai

Ulmaceae

Aphananthe aspera (Thunb.) Planch.

Celtis biondii Pamp.

Celtis tetrandra Roxb. ssp. *sinensis* (Pers.)

Y. C. Tang

Ulmus changii Cheng

Ulmus parvifolia Jacq.

Zelkova schneideriana Hand.-Mazz

Moraceae

Broussonetia kazinoki Sieb.

Broussonetia papyrifera (L.) L'Her ex Vent.

Cudrania cochinchinensis (Lour.) Kudo et Mas
am.

Cudrania tricuspidata (Carr.) Bur. ex Lavall.

Fatoua pilosa Gaud.

Ficus pumila L.

Ficus sarmentosa Buch-Ham. ex J. E. Sm. var.

henryi (King) Corner

Humulus scandens (Lour.) Merr.

Morus alba L.

Morus cathayana Hemsl.

Urticaceae

Boehmeria nivea (L.) Gaud.

<i>Boehmeria nivea</i> (L.)Gaud.var. <i>candicans</i> Wedd.	<i>Rumex acetosella</i> L.
<i>Boehmeria plantanifolia</i> Franch.	<i>Rumex crispus</i> L.
<i>Elatostema involueratum</i> Franch.et Sav.	<i>Rumex dentatus</i> L.
<i>Gonostegia hieta</i> (Bl.) Miq.	<i>Rumex japonicus</i> Houtt.
<i>Nanocnide japonica</i> Bl.	Chenopodiaceae
<i>Nanocnide pilosa</i> Migo	<i>Chenopodium ambrosioides</i> L.
<i>Oreocnide frutescens</i> (Thunb.) Miq	Amaranthaceae
<i>Pellionia scabra</i> Benth.	<i>Achyranthes bidentata</i> Bl.
<i>Pilea japonica</i> (Maxim.)Hand.-Mazz.	<i>Achyranthes longifolia</i> (Makino) Makino
<i>Pilea pumila</i> (L.) A.Gray	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.
<i>Pilea notata</i> C.H.Wright	<i>Amaranthus spinosus</i> L.
<i>Pilea peploides</i> (Gaud.)Hook.et Arn.	<i>Celosia argentea</i> L.
<i>Pilea angulata</i> Bl.	Phytolaccaceae
<i>Urtica fissa</i> Pritz.	<i>Phytolacca americana</i> L.
Proteaceae	Aizoaceae
<i>Helicia cochinchinensis</i> Lour.	<i>Mollugo pentaphylla</i> L.
Olacaceae	Portulacaceae
<i>Schoepfia jasminodora</i> Sieb.et Zucc.	<i>Portulaca oleracea</i> L.
Aristolochiaceae	<i>Talinum paniculatum</i> (Jacq.)Gaertn.
<i>Aristolochia debilis</i> Sied.et Zucc.	Caryophyllaceae
<i>Asarum forbesii</i> Maxim.	<i>Arenaria serpyllifolia</i> L.
Polygonaceae	<i>Cerastium caespitosum</i> Gilib.
<i>Antenoron filiforme</i> (Thunb.) Roberty et Vautier	<i>Malachium aquaticum</i> (L.) Fries
<i>Antenoron neofiliforme</i> (Nakai) Hara	<i>Pseudostellaria heterophylla</i> (Miq.) Pax
<i>Fagopyrum dibotrys</i> (D.Don) Hara	<i>Sagina japonica</i> (Sw.) Ohwi
<i>Polygonum nepalense</i> Meisn.	<i>Stellaria uliginosa</i> Murr.
<i>Polygonum aviculare</i> L.	<i>Stellaria media</i> (L.)Cyr.
<i>Polygonum criopolitanum</i> Hance.	Ranunculaceae
<i>Polygonum cuspidata</i> Sieb.et Zucc.	<i>Clematis apiifolia</i> DC.
<i>Polygonum hydropiper</i> L.	<i>Clematis finetiana</i> Levl.et Vant
<i>Polygonum lapathifolium</i> L.	<i>Clematis henryi</i> Olib.
<i>Polygonum longisetum</i> De Bruyn	<i>Clematis uncinata</i> Champ.
<i>Polygonum multiflorum</i> Thunb.	<i>Delphinium anthriscifolium</i> Hance.
<i>Polygonum perfoliatum</i> L.	<i>Ranunculus chinensis</i> Bunge
<i>Polygonum plebeium</i> R.Br.	<i>Ranunculus japonicus</i> Thunb.
<i>Polygonum posumbu</i> Buch.-Ham.ex D.Don	<i>Ranunculus sieboldii</i> Miq.
<i>Polygonum praetermissum</i> Hook.f.	<i>Semiaquilegia adoxoides</i> (DC.)Makino.
<i>Polygonum pubescens</i> Bl.	<i>Thalictrum fortunei</i> S.Moore
<i>Polygonum senticosum</i> (Meisn.)Franch.et Savat.	Lardizabalaceae
<i>Polygonum thunbergii</i> Sieb.et Zucc.	<i>Akebia quinata</i> (Thunb.)Decne.
<i>Rumex acetosa</i> L.	<i>Akebia trifoliata</i> (Thunb.) Koidz.
	<i>Holboellia coriacea</i> Diels
	<i>Sargentodoxa cuneata</i> (Oliv.) Rehd.et Wils.
	<i>Stauntonia conspicua</i> R. H. Chang

Stauntonia obovata Hemsl.

Stauntonia obovatifoliola Hayata subsp. *urophylla* (Hand.-Mazz.) H.N.Qin

Berberidaceae

Dysosma pleiantha (Hance) Woodson

Mahonia bealei (Fort.) Carr.

Menispermaceae

Cocculus orbiculatus(L.) DC.

Sinomenium acutum (Thunb.)Rehd.et Wils.

*Stephania cepharatha*Hayata.

Stephania japonica(Thunb.)Miers.

Magnoliaceae

Illicium lanceolatum A.C.Smith

Kadsura longipedunculata Finet etGagnep

Liriodendron chinense (Hemsl.) Sarg.

Magnolia denudata Desr.

Schisandra henryi Clarke

Schisandra sphenanthera Rehd.et Wils.

Lauraceae

Cinnamomum camphora (L.)Presl.

*Cinnamomum chekiangense*Nakai.

Cinnamomum subavenium Miq.

*Lindera erythrocarpa*Makino.

Lindera glauca (Sieb. et Zucc.) Bl.

Lindera rubronervia Gamble

Lindera aggregata(Sims) Kosterm.

Lindera neesiana (Nees) Kurz

Lindera reflexa Hemsl.

Litsea coreana Levl.var. *sinensis*(Allen) Yang et P.H.Huang

Litsea cubeba (Lour.)Pers.

Machilus leptophylla Hand.-Mazz

Machilus pauhoi Kanehira

Machilus thunbergii Sieb.et Zucc

Neolitsea aurata(Hayata) Koidz.var. *chekiangensis* (Nakai) Yang et P.H.Huang

Phoebe sheareri(Hemsl.) Gamble

Sassafras tzumu(Hemsl.)Hemsl.

Papaveraceae

*Corydalis edulis*Maxim.

Corydalis incisa(Thunb.)Pers.

Corydalis pallida (Thunb.)Pers.

Corydalis racemosa(Thunb.)Pers.

Macleaya cordata(Wild.) R.Br

Cruciferae

Arabis flagellosa Miq

Capsella bursa-pastoris (Linn)Medic.

*Cardamine hirsuta*L.

Cardamine leucantha(Tousch) O.E.Schulz.

*Cardamine limprichtiana*Pax.

Cardamine lyrata Bunge.

Coronopus didymus(L.) Smith

*Draba nemorosa*L.

Lepidium virginicum L.

Rorippa indica (L.)Hiern.

Droseraceae

Drosera peltata Smith var. *glabrata* Y.Z.Ruan

Crassulaceae

*Sedum alfredii*Hance

Sedum bulbiferum Makino

Sedum emarginatum Migo

*Sedum sarmentosum*Bunge

Sedum verticillatum L.

Saxifragaceae

Deutzia ningpoensis Rehd.

Hydrangea chinensis Maxim.

Hydrangea rosthornii Diels in Engl.

Itea chinensis Hook. et Arn. var. *oblonga* (Hand.-Mazz.) Wu

*Penthorum chinense*Pursh.

Philadelphus brachybotrys (Koebe) var. *laxiflorus* (Cheng) S.Y.Hu

Philadelphus sericanthus Koenne

Pileostegia viburnoides Hook. f. et Thoms.

*Saxifraga stolonifera*Meerb.

Schizophragma integrifolium (Franch.)Oliv.

Pittosporaceae

Pittosporum illicioides Makino

Hamamelidaceae

*Liquidambar formosana*Hance

Loropetalum chinense (R.Br) Oliv.

Rosaceae

*Agrimonia pilosa*Ledeb.

Amygdalus persica L.

Cerasus discoidea Yu et Li

Cerasus serrulata (Lindl.) G. Don ex London

Cerasus serrulata (Lindl.) G. Don ex London var. *pubescens* (Makino) Yu et Li

- Crataegus cuneata* Sieb. et Zucc.
Duchesnea indica (Andr.) Focke
Eriobotrya japonica (Thunb.) Lindl.
Geum japonicum Thunb. var. *chinensis* F. Bolle
Laurocerasus spinulosa (Sieb. et Zucc.) Schneid.
Malus hupehensis (Pamp.) Rehd.
Padus brachypoda (Batal.) Schneid.
Photinia glabra (Thunb.) Maxim.
Photinia parvifolia (Pritz.) Schneid.
Photinia serrulata Lindl.
Photinia subumbellata Rehd. et Wils.
Photinia beauverdiana Schneid.
Photinia beauverdiana Schneid. var. *brevifolia* Card.
Potentilla chinensis Ser.
Potentilla discolor Bunge
Potentilla freyniana Bornm.
Potentilla sundaica (Bl.) Kuntze
Pyrus calleryana Decne.
Raphiolepis indica (L.) Lindl.
Rosa bracteata Wendl.
Rosa cymosa Tratt.
Rosa henryi Boulenger
Rosa laevigata Thunb.
Rosa multiflora Thunb.
Rosa multiflora Thunb. var. *cathayensis* Rehd. et Wils.
Rubus amphidasys Focke ex Diels
Rubus buergeri Miq.
Rubus corchorifolius L. f.
Rubus coreanus Miq.
Rubus hirsutus Thunb.
Rubus lambertianus Ser.
Rubus pacificus Hance
Rubus parvifolius L.
Rubus trianthus Focke
Sanguisorba officinalis L.
- Leguminosae**
- Albizia kalkora* (Roxb.) Prain
Albizia julibrissin Durazz.
Caesalpinia decapetala (Roth) Alston
Crotalaria sessiliflora L.
- Dalbergia upeana* Hance
Desmodium caudatum (Thunb.) DC.
Desmodium heterocarpon (L.) DC.
Glycine soja Sieb. et Zucc.
Hylodesmum podocarpum (DC.) H. Ohashi et R.R. Mill.
Hylodesmum podocarpum ssp. *fallax* (Schindl.) H. Ohashi et R.R. Mill.
Hylodesmum podocarpum ssp. *oxyphyllum* (DC.) H. Ohashi et R.R. Mill.
Indigofera decora var. *cooperi* (Craib) Y.Y. Fang et C.Z. Zheng
Indigofera fortunei Craib
Indigofera pseudotinctoria Mats.
Kummerowia stipulacea (Maxim.) Makino
Kummerowia striata (Thunb.) Schindl.
Lespedeza cuneata (Dom. Cours.) G. Don
Lespedeza formosa (Vog.) Koehne
Lespedeza pilosa (Thunb.) Sieb. et Zucc.
Lespedeza thunbergii (DC.) Nakai
Millettia dielsiana Harm.
M. reticulata Benth.
Mucuna sempervirens Hemsl.
Ormosia henryi Prain
Pueraria lobata (Willd.) Ohwi
Rhynchosia acuminatifolia Makino
Rhynchosia volubilis Lour.
Sophora japonica L.
Vicia hirsuta (Linn.) S.F. Gray
Vigna vexillata (Linn.) A. Rich.
Wisteria sinensis (Sims) Sweet
- Oxalidaceae**
- Oxalis corniculata* L.
- Geraniaceae**
- Geranium carolinianum* L.
G. nepalense Sweet. var. *thunbergii* (Sieb. et Zucc.) Kudo
- Rutaceae**
- Boenninghausenia albiflora* (Hook.) Reichb. ex Meissn.
Citrus maxima (Burm.) Merr.
Citrus reticulata Blanco
Euodia fargesii Dode
Zanthoxylum armatum DC.

Simarubaceae

Ailanthus altissima(Mill.) Swingle
Picrasma quassioides (D.Don) Benn.

Meliaceae

*Melia azedarach*L.
Toona sinensis(A. Juss.) Boem.

Polygalaceae

Polygala hongkongensis Hemsl. var.
stenophylla(Hayata) Migo
Polygala japonica Houtt.

Euphorbiaceae

Acalypha australis L.
Euphorbia helioscopia L.
Euphorbia supina L.
Euphorbia pekinensis Rupr.
Glochidion puberum (L.) Hutch.
Mallotus repandus(Willd.) Muell-Arg.
Mallotus. apelta (Lour.) Muell-Arg.
Mallotus japonicus(Thunb.) Muell.-Arg. var.
floccosus (Muell.-Arg.) S.M.Hwang
Phyllanthus glaucus Wall. ex Muell. -Arg.
*Phyllanthus matsumrae*Hayata
Phyllanthus urinaria L.
Sapium japonicum (Sieb.et Zucc.) Pax et Hoffm.
Sapium Sebiferum (L.) Roxb.
Vernicia fordii (Hemsl.) Airy.-Shaw.

Anacardiaceae

Pistacia chinensis Bunge
Rhus chinensis Mill.
Toxicodendron succedanea(L.) O.Kuntz.
Toxicodendron sylvestris(Sieb. et Zucc.) O. Kuntz.

Aquifoliaceae

Ilex cornuta Lindl.
Ilex elmerrilliana S.Y.Hu
Ilex latifolia Thunb.
Ilex ficodea Henmsl.
Ilex listeaofolia Hu et Tang
Ilex micrococca Maxim.
Ilex pubescens Hook.et Arn.
*Ilex purpurea*Hassk.
Ilex rotunda Thunb.
Ilex wilsonii Loes

Celastraceae

Celastrus oblanceifolius Wang et Tsoong
Celastrus gemmatus Loes
*Celastrus orbiculatus*Thunb.
Celastrus stylosus var. *puberulus* (Hsu)
C.Y.Cheng et T.C.Kao
Euonymus carnosus Hemsl.
Euonymus fortunei(Turcz.) Hand.-Mazz.
Euonymus kiautschovicus Loes.
*Euonymus centidens*Levl.
Tripterygium wilfordii Hook. f.

Staphyleaceae

Euscaphis japonica(Thunb.) Kanitz

Aceraceae

*Acer davidii*Franch.

Sabiaceae

Meliosma myriantha Sieb.et Zucc.
Meliosma myriantha Sieb.et Zucc. var. *pilosa*
(Lec.) Law
Meliosma oldhamii Miq.
Meliosma veitchiorum Hemsl.
Sabia campanulata ssp. *ritchiae* (Rehd.et
Wils.) Y.F.Wu
*Sabia japonica*Maxim.

Balsaminaceae

Impatiens platisepala Y. L. Chen

Rhamnaceae

Berchemia floribunda (Wall.) Brongn.
Hovenia dulcis Lindl.
Rhamnus crenata Sieb. et Zucc.
Rhamnus globosa Bunge
Sageretia melliana Hand.-Mazz.
Sageretia thea (Osbeck.) M.C.Johnst.

Vitaceae

Ampelopsis brevipedunculata Maxim. var.
heterophylla (Thunb.) Hara
Ampelopsis cantoniensis(Hook. et Arn.)
Planch.
Ampelopsis sinica (Miq) W.T.Wang
Cayratia japonica(Thunb.) Gagnep.
Cayratia oligocarpa (Levl.et. Vant.) Gagnep.
*Parthenocissus laetivirens*Rehd.
Parthenocissus heterophylla (Bl.) Merr.
Parthenocissus tricuspidata(Sieb. et Zucc.)

Planch.

Petrastigma hemsleyanum Diels et Gilg.

Vitis davidii (Roman.) Foex.

Vitis flexuosa Thunb.

Vitis pseudoreticulata W.T.Wang

Vitis wilsonae Veitch.

Elaeocarpaceae

Elaeocarpus glabripetalus Merr.

Elaeocarpus sylvestris (Lour.) Poir

Tiliaceae

Corchoropsis tomentosa (Thunb.) Makino

Grewia biloba G.Don var. *parviflora* (Bunge)

Hand.-Mazz.

Actinidiaceae

Actinidia callosa Lindl. var. *henryi* Maxim.

Actinidia chinensis Planch.

Theaceae

Camellia oleifera Abel *

Camellia sinensis (Linn.) O.Ktze.

Camellia fraterna Hance

Cleyera japonica Thunb.

Eurya hebeclados Ling

Eurya muricata Dunn

Eurya rubiginosa H.T.Chang var. *attenuata*

Chang

Schima superba Gardn. et Champ.

Stewartia sinensis Rehd. et Wils.

Ternstroenia gymnanthera (Wight. et Arn.)

Sprague

Guttiferae

Hypericum erectum Thunb.

Hypericum japonicum Thunb.

Hypericum sampsonii Hance

Violaceae

Viola acuminata Ledeb.

Viola concordifolia C.J.Wang

Viola diffusa Ging.

Viola grypoceras A.Gray

Viola verecunda A.Gray

Viola yedoensis Makino

Flacourtiaceae

Idesia polycarpa Maxim.

Xylosma japonica (Walp.) A.Gray

Stachyuraceae

Stachyurus chinensis Franch.

Thymelaeaceae

Wikstroemia pilosa Cheng

Elaeagnaceae

Elaeagnus glabra Thunb.

Elaeagnus pungens Thunb.

Nyssaceae

Nyssa sinensis Oliv.

Alangiaceae

Alangium chinense (Lour.) Harms

Alangium kurzii Craib

Myrtaceae

Syzygium buxifolium Hook. et Arn.

Syzygium grijsii (Hance) Merr. et Perry

Melastomaceae

Melastoma dodecandrum Lour.

Araliaceae

Aralia dasyphyloides (Hand.-Mazz.) J.Wen

Aralia chinensis L.

Aralia echinocaulis Hand.-Mazz.

Hedera nepalensis K.Koch var. *sinensis* (Tobl.)

Rehd

Umbelliferae

Angelica decuroia (Mig.) Franch. et Sav.

Bupleurum chinense DC.

Centella asiatica (L.) Urban

Daucus carota L.

Heracleum moellendorffii Hance

Hydrocotyle sibthorpioides Lam.

Nothosmyrnum japonicum Miq.

Osmorrhiza aristata (Thunb.) Makino et Yabe

Peucedanum decursivum (Miq.) Maxim.

Peucedanum praeruptorum Dunn

Sanicula chinensis Bunge

Torilis scabra (Thunb.) DC.

Cornaceae

Helwingia japonica (Thunb.) F.G.Dietr

Ericaceae

Lyonia ovalifolia var. *hebecarpa* (Franch.ex

Forb.et Hemsl.) Chun

Pieris japonica (Thunb.) D.Don

Rhododendron latoucheae Franch.

Rhododendron mariesii Hemsl. et Wils.

Rhododendron ovatum Planch.

Rhododendron simsii Planch.

Vaccinium bracteatum Thunb.

Vaccinium carlesii Dunn

Vaccinium sprengelii (G.Don) Sleumer

Vaccinium trichocladum Merr.

Myrsinaceae

Ardisia brevicaulis Diels

Ardisia crenata Sims

Ardisia crispa (Thunb.) A. DC.

Ardisia japonica (Hoensted) Bl.

Ardisia violacea (Suzuki) W.Z. Fang et Yao

Maesa japonica (Thunb.) Moritzi

Primulaceae

Androsace umbellata (Lour.) Merr.

Lysimachia christinae Hance

Lysimachia clethroides Duby

Lysimachia fortunei Maxim.

Lysimachia hemsleyana Maxim.

Lysimachia remota Petitm.

Primula cicutarifolia Pax

Ebenaceae

Diospyros glaucifolia Metc.

Diospyros kakai L.f.

Diospyros kakai L.f. var. *sylvestris* Makio

Symplocaceae

Symplocos anomala Brand.

Symplocos chinensis (Lour.) Druce

Symplocos caudata Wall. ex DC.

Symplocos paniculata (Thunb.) Miq.

Symplocos sotchuensis Brand

Symplocos stellaris Brand

Styracaceae

Pterostyrax corymbosa Sieb. et Zucc.

Styrax confusa Hemsl.

Styrax faberi Perk.

Styrax odoratissima Champ.

Oleaceae

Chionanthus retusus Lindl.

Fersythia viridissima Lindl.

Fraxinus insularis Hemsl.

Jasminum lanceolarium Roxb.

Jasminum sinense Hemsl.

Ligustrum lucidum Ait.

Ligustrum sinense Lour.

Osmanthus cooperi Hemsl.

Osmanthus fragrans (Thunb.) Lour.

Loganiaceae

Buddleja lindleyana Fort.

Gentianaceae

Tripterospermum chinense (Migo) H. Smith ex Nilsson

Apocynaceae

Trachelospermum jasminoides (Lindl.) Lem.

Asclepiadaceae

Cynanchum auriculatum Royle ex Wight

Marsdenia sinensis Hemsl. Makino

Convovulaceae

Cuscuta japonica Choisy

Porana racemosa Roxb.

Borraginaceae

Bothriospermum tenellum (Hornem.) Fisch. et Mey

Ehretia acuminata R.Br. var. *obovata* (Lindl.) Johnston

Lithospermum arvense L.

Omphalotrigonotis cupulifera (Johnst.) W.T. Wang

Thyrocaepus sampsoni Hance

Trigonotis peduncularis (Trev.) Benth.

Verbenaceae

Callicarpa cathayana

Callicarpa giraldii Hesse ex Rehd.

Callicarpa japonica Thunb.

Caryopteris incana (Thunb.) Miq.

Caryopteris nepetaefolia (Benth.) Maxim.

Clerodendrum cyrtophyllum Turcz.

Clerodendrum lindleyi Dence. ex Planch.

Clerodendrum trichotomum Thunb.

Clerodendrum kaichianum Hsu

Premna microphylla Turcz.

Verbena officinalis L.

Vitex negundo L. var. *cannabifolia* (Sieb. et Zucc.) Mazz.

Labiatae

Ajuga decumbens Thunb.

Clinopodium chinense (Benth.) O. Kuntze

Clinopodium confine O. Kuntze

Clinopodium gracile (Benth.) Mats.

- Elsholtzia ciliata* (Thunb.) Hyland.
Galeobdolon chinensis (Benth.) C.Y.Wu
Glechoma longituba (Nakai) Kupr.
Keiskea sinensis Diels
Lamium amplexcaule L.
Lamium barbatum Sieb. et Zucc.
Leonurus artemisia (Lour.) S.Y.Hu
Lycopus coreanus Levl.
Mentha haplocalyx Briq.
Mosla chinensis Maxim.
Mosla scabra (Thunb.) C.Y.Wu et H.W.Li
Perilla frutescens (L.) Britt. var. *acuta* (Thunb.) Kudo
Perilla frutescens (L.) Britt. var. *acuta* (Thunb.) Kudo var. *crispa* (Thunb.) Hand.-Mazz.
Prunella vulgaris L.
Rabdosia amethystoides (Benth.) Hara
Rabdosia serra (Maxim.) Hara
Salvia chinensis Benth.
Salvia japonica Thunb.
Salvia miltiorrhiza Bunge
Scutellaria barbata D.Don
Scutellaria pekinensis Maxim.
Scutellaria tuberifera C.Y.Wu et C.Chen
- Solanaceae**
Physalia alkekengi L. var. *francheti* (Mats.) Makino
Physalia angulata L. var. *villosa* Bonati
Solanum lyratum Thunb.
Solanum pitosporifolium Hemsl.
Solanum nigrum L.
Tubocapsicum anomalum (Franch. et Sav.) Makino
- Scrophulariaceae**
Lindernia anagallis (Burm.f.) Pennell.
Lindernia antipoda (L.) Alston
Lindernia crustacea (L.) F.-Muell.
Mazus miquelii Makino
Mazus japonicus (Thunb.) C.Kuntze
Mazus stachydifolius (Turcz.) Maxim.
Monochasma savatieri Franch. ex Maxim.
Paulownia fortunei (Seem.) Hemsl.
Paulownia kawakamii Ito
Siphonostorgia laeta S.Moore
- Veronica arvensis* L.
Veronica didyma Tenore
Veronica persica Poir.
Veronicastrum axillare (Sieb. et Zucc.) Yamazaki
- Orobanchaceae**
Aeginetia indica Roxb.
- Gesneriaceae**
Hemiboea henryi Clarke
Lysionotus pauciflorus Maxim.
- Acanthaceae**
Peristrophe japonica (Thunb.) Brem.
Rostellularia procumbens (L.) Nees
Strobilanthus oliganthus Miq.
- Plantaginaceae**
Plantago asiatica L.
- Rubiaceae**
Damnacanthus giganteus (Mak.) Nakai
Emmenopterys henryi Oliv.
Galium aparine L. var. *tenerum* (Grem. et Godr.) Reichb.
Galium bungei Steud.
Gardenia jasminoides Ellis
Hedyotis chrysotricha (Palib.) Merr.
Hedyotis diffusa Willd.
Morinda umbellata L.
Mussaenda shikokiana Makino
Paederia cavaleriei Levl.
Paederia scandens (Lour.) Merr. var. *tomentosa* (Bl.) Hand.-Mazz.
Rubia argyi (Levl. et Vant) Hara ex Lauener
Serissa serissoides (DC.) Druce
Sinadina racemosa (Sieb. et Zucc.) Ridsdale
Thysanosperrum diffusum Champ. ex Benth.
Tricalysia dubia (Lindl.) Ohwi
Uncaria rhynchophylla (Miq.) Miq. ex Havil.
- Caprifoliaceae**
Lonicera japonica Thunb.
Sambucus chinensis Lindl.
Sambucus williamsii Hance
Viburnum dilatatum Thunb.
Viburnum erosum Thunb.
Viburnum setigerum Hance
- Valerianaceae**

Patrinia punctiflora Hsu et H.J.Wang

Patrinia villosa Juss.

Cucurbitaceae

Gynostemma pentaphyllum (Thunb.) Makino

Thladiantha nudiflora Hemsl. ex Forb. et Hemsl.

Trichosanthes cucumeroides (Ser.) Maxim.

Trichosanthes kirilowii Maxim

Campanulaceae

Codonopsis lanceolata (Sieb. et Zucc.) Trautv.

Compositae

Adenostemma lavenia (L.) O.Kuntze

Ageratum conyzoides L.

Ainsiaea fragrans Champ.

Ainsiaea macroclinioides Hayata

Artemisia anomala S.Moore

Artemisia dubia Wall. ex DC.

Artemisia japonica Thunb.

Artemisia lactiflora Wall. ex DC.

Artemisia lavandulaefolia DC.

Aster ageratoides Turcz.

var. *scaberulus* Ling

Aster turbintus S.Moore

Bidens bipinnata L.

Bidens biternata (Lour.) Merr. et Scherff.

Bidens frondosa L.

Bidens tripartita L.

Carpesium arbrotanoides L.

Carpesium divaricatum Sieb. et Zucc.

Centipeda minima (L.) A.Br. et Aschera.

Cirsium japonicum (DC.) Maxim.

Conyza bonariensis (L.) Cronq.

Conyza canadensis (L.) Cronq.

Dendranthema indica (L.) Des Moul.

Doellingeria scabra (Thunb.) Nees

Eclipta prostrata (L.) L.

Erigeron annuus (L.) Pers.

Eupatorium chinense L.

Eupatorium japonicum Thunb.

Gnaphalium affine D.Don

Gnaphalium hypoleucum DC.

Gnaphalium japonicum Thunb.

Hemistepta lyrata Bunge

Ixeris chinensis (Thunb.) Nakai

Ixeris debilis (Thunb.) Gray

Ixeris dentata (Thunb.) Nakai

Ixeris polycephala Cass.

Kalimeris indica (L.) Schulz.-Bip.

Kalimeris shimadae (Kitam.) Kitam.

Lactuca indica L.

Saussurea japonica (Thunb.) DC.

Scorzonera oldhamianus Maxim.

Senecio scandens Buch.-Ham.

Siegesbeckia glabrescens (Makino) Makino

Siegesbeckia pubescens (Makino) Makino

Solidago decurrens Lour.

Taraxacum mongolicum Hand.-Mazz.

Turczaninovia fastigiata (Fisch.) DC.

Xanthium sibiricum Patr. ex Widd.

Youngia erythrocarpa (Vant.) Badc. et Stebb.

Youngia japonica (L.) DC.

Gramineae

Indocalamus latifolius (Keng) McClure

Phyllostachys nuda McClure

Phyllostachys viridis (Yong) McClure

Pleilpblastus amorus (Keng) Keng f.

Agrostis matsumurae Hack.

Alopocurus aequalis Sobol.

Arthraxon hispidus (Thunb.) Makino

Arundinella hirta (Thunb.) C.Tanaka

Avena fatua L.

Calamagrostis arundinacea (L.) Roth

Capillipedium assimile (Steud.) A.Camus

Capillipedium parviflorum (R.Br) Stapf.

Cleistogenes hackelii (Honda) Honda

Cynodon dactylon (L.) Pers.

Deyeuxia hupehensis Rendle

Digitaria ciliaris (Retz.) Koeler

Digitaria sanguinalis (L.) Scop.

Digitaria violascens Link.

Echinochloa indica (L.) Gaertn.

Eremochloa ophiuroides (Munro) Hack.

Glyceria acutiflora Torr. ssp. *japonica* (Steud.)

T.Koyam et Kawano

Imperata cylindrica (L.) Beauv. var. *major*

(Lees) C.E.Hubb.

Isachne globosa (Thunb.) Kuntze

Leptochloa chinensis (L.) Nees

Leptochloa panicea (Retz.) Ohwi
Lophatherum gracile Brongn.
Microstegium nudum (Trin.) A.Camus
Microstegium vimineum (Trim.) A.Camus
Miscanthus floridulus(Labill.) Warb.
Miscanthus sinensis Ander.
*Muhlenbergia japonica*Stued.
Neyraudia montana Keng
Oplismenus compositus(L.) Beauv.
*Poa acroleuca*Steud.
*Poa annual*L.
Polygopon fugax Nees ex Steud.
Roegneria kamoji Ohwi
Setaria faberi Herrm.
Setaria glauca(L.) Beauv.
Setaria palmifolia (Koen) Stapf.
Setaria plicata(Lam.) T.Cooke
Setaria viridis(L.) Beauv.
Cyperaceae
*Carex brunnea*Thunb.
*Carex dispalata*Boott
*Carex doniana*Spreng.
*Carex gibba*Wahl.
*Carex pruinosa*Boott
Carex scabrifolia Steud.
*Carex simulans*Clarke
*Cyperus amuricus*Maxim.
*Cyperus compressus*L.
Cyperus glomeratus L.
*Cyperus pilosus*Vahl.
Cyperus rotundus L.
Eleocharis acicularis (L.) Roem. et Schult. var.
longiseta Svenson
*Eleocharis tetraquetra*Nees
Mariscus umbellatus Vahl.
Pycereus globosus(All.) Reichb.
*Scirpus subcapitatus*Thw.
Araceae
Acorus tatarinowii Schott
Arisaema sikokianum Franch. et Savat. var.
serratum (Makino) Hand.-Mazz.
Pinellia cordata N.E.Brown
Pinellia ternata(Thunb.) Breit.
Commelinaceae

Commelina communis L.
*Pollia japonica*Thunb.
Stemonaceae
Stemona japonica (Retz.) Miq.
Liliaceae
Aletris spicata Franch.
*Aletris macrostemon*Bunge
Asperagus cochinchinensis (Lour.) Merr.
Aspidistra oblanceifolia F.T.Wang et K.Y.Lan
g
Disporum sessile D.Don
*Hemerocallis fulva*L.
Heterosmilax japonica Kunth
Hosta verticosa (Salisb.) Stearn.
Lilium brownii F.E.Brow var. *viridulum*Baker
Liriope muscari(Decne.) Bailey
Liriope graminifolia (Linn.) Baker
Liriope spicata (Thunb.) Lour.
Ophiopogon japonicus(L.f.)Kew.-Gawl.
Paris polyphylla Sm. var. *chinensis* (Fr.) Hara
*Polygonatum cyrtoneura*Hua
Polygonatum odoratum(Mill.) Druce
*Smilax china*L.
Smilax davidiana A.DC.
*Smilax glabra*Roxb.
Smilax glauca-china Warb.
Smilax lanceifolia Roxb. var. *opaca* A.DC.
Tricyrtis macropoda Miq.
Amaryllidaceae
*Curculigo orchioides*Gaertn.
Lycoris radiata (L'Her) Herb.
Dioscoreaceae
Dioscorea bulbifera L.
Dioscorea opposita Thunb.
Iridaceae
Iris proantha Diels
Zingiberaceae
Zingiber mioga (Thunb.) Rosc.
Orchidaceae
Cymbidium faberi Rolfe
Cymbidium goeringii (Reichb.f.) Reichb.f.
Goodyera schlechtendaliana Reichb.f.
Pleione bulbocodioides (Franch.) Rolfe
Spiranthes sinensis(Pers.) Ames

4. Animals in Kuajishan Ancient Chinese Torreya Community

Reptilia

Squamata

Lacertilia

Gekkonidae

Gekko japonicus

Serpentes/Ophidia

Elapidae

Naja naja

Viper ideo

Agkistrodon halys

Agkistrodon scutus

Trimeresurus stsjegeri

Colubridae

Natrix natrix

Elaphe rufodorsata

Elaphe carinata

Elaphe taeniura

Ptyas mucosus

Ptyas Rorros

Zaocys dhumnades

Zaocys nigromargimatus

Testudines

Testudinidae

Chinemys reevesii

Trionychidae

Pelodiscus sinensis

Rafetus swinhoei

Reptilia

Artiodactyla

Suidae

Sus scrofa Linnaeus

Cervidae

Hydropotes inermis Swinhoe

Muntiacus reevesi Ogilby

Muntiacus muntjar

Muntiacus Crinifrons Sclatar

Bovidae

Cephalotrupes

Capricornis sumatraensis

Insessivora

Erinaceidae

Erinaceus europaeus Linnaeus

Soricidae

Crocodylus suaueolens Pallas

Crocodylus attenuata Milne-Edwards

Crocodylus dracula Thomas

Suncus murinus Linnaeus

Talpidae

Mogera latauchei Thomas

Carnivora

Canidae

Cuon alpinus Pallas

Mustelidae

Mustela sibirica Pallas

Mustela Rathiah Hodgson

Martes flavigula Boddaert

Melogale moschata Gray

Meles meles Linnaeus

Arctonyx collaris F.Cuvier

Lutra lutra Linnaeus

Felidae

Felis bengalensis Kerr

Panthera pardus Linnaeus

Viverridae

Pogona Laruata Hamilton-Smith

Herpetes urua Hodgson

Pholidota

Manidae

Manis Pentadactyla Linnaeus

Lagomorpha

Leporidae

Lepus capensis

Rodentia

Sciuridae

Callosciurus evythraeus Pallas

Sciurus Uulgaris

Sciurus Vulgaris

Tomomys szuinhoei Milne-Edwards

Cricetidae

Eothenomys lanogaster Milne-Edwards

Muridae

Micromys minutus Pallas

Apodemus agrarius Pallas

Rattus fcauipectus Milne-Edwards

Mus musculus

Rattus norvegicus

Rattus fulvescens Gray

Rattus nitidus Hodgson

Rattus bozversi Anderson

Rattus bozversi Anderson

Hystriidae

Hystrix hodgsoni Gray

Chiroptera

Vespertilionidae

Pipistrellus abramus Temminck

Myotis formosus Hodgson

Myotis chinensis Tomes

Eptesicus serotinus Schreber

Miniopterus sehreibersi Kuhl

Emballonuridae

Vespertilio supeans

Myriopoda

Epimorpha

Scolopendridae

Scolopendra subspinipes

Arachnoidea

Scorpinda

Buthide

Buthus marenzi

Ares

Pleormes

Picidae

Picus canus

Mulleripicus pulve rulentus

Dryocopus martius

Passeriformes

Pittidae

Pitta brachyuran (Linnaeus)

Alaudidae

Alauda gulgula Franklin

A. gulgula coelivox Swinhoe

A. arvensis

A. arvensis intermedia Swinhoe

Hirudinidae

Hirundo rustica Linnaeus

H. rustica guttuvalis

H. rustica Linnaeus

H. rustica japonica Temminck et schlegel

Laniidae

Lanius escubitor

L. busephalus Temminck et schlegel

L. cristatus Linnaeus

L. cristatus Lucionensis Linnaeus

L. schach Linnaeus

L. schach schach Linnaeus

Oriolidae

Oriolus oriolus

O. chinensis Linnaeus

O. chinensis diffuses sharps

Sturnidae

Acridotheres cristatellus(Linnaeus)

A. crstatellus cristatellus (Linnaeus)

A.albocinctus

Sturnus sinensis(Gmelin)

S.sturninus(Pallas)

S.sericeus(Gmelin)

S.cineraceus Temminck

Corvidae

Cyanopica cyana(Pallas)

Pica pica(Linnaeus)

Corvus frugilegus

C.torguatus

C.moneduta

C.macrorhynchus

Cissa erythrorhyncha(Boddaert)

Crypsirina formosae(Swinhoe)

Corvus corone Linnaeus

Muscicapidae

Garrulax canorns

G.canorns(Linnaeus)

Leiothrix argentauris

L.lutea

Pomatorhinus erythrogemys Vig

P.erythrogenys swihoei David

P.rusicollis Hodgson

P.rusicollis styati Seebohm

P.rusicollisstridulus Swinhoe

Stachyris ruficeps Blyth

S.ruficeps davidi(Oustalet)

Garrulax perspillatus(Gmelin)

G.pectoralis(Gould)

G.pectoralis picticollis Swinhoe

G.sannis Swinhoe

<i>G.cineraceus sinereicepe</i> (styan)	<i>T.cyanurus cyanuru</i>
<i>G.sannis</i> Swinhoe	<i>Copsychus saularis</i> (Linnaeus)
<i>G.sannio sannio</i> Swinhoe	<i>Phoenicurus aureus</i> (Pallas)
<i>Alcippe morrisonia</i> Swinhoe	<i>Rhyacornis fuliginosus</i> (Vigors)
<i>A.morrisonia hueti</i> David	<i>Enicurus scouleri</i> Vigors
<i>Paradoxornis uebbianus</i> (Gray)	<i>E. leschenaulti</i> (Vieillot)
<i>P.webbianus webbianus</i> (Gray)	<i>Saxicola ferrea</i> (Gray)
<i>P.divaricatus</i> (Raffles)	<i>S.ferrea haringtoni</i> (Hartert)
<i>P.divaricatus divaricatus</i> (Raffles)	<i>Monticola cinclorhynchus</i> (Vigors)
<i>P.webbianus suffusus</i> (Swinhoe)	<i>M. cinclorhynchus gularis</i> (Swinhoe)
<i>P.gularis</i> Gray	<i>M.solitaria</i> (Linnaeus)
<i>P.gularis foriensis</i> (David)	<i>M solitaria pandoo</i> (Syuse)
Sylviinas	<i>M.solitaria philippensis</i> (Muller)
<i>Cettia fortipes</i>	<i>Myiophoneus caeruleus</i> (seopoli)
<i>C. fortipes dauidiana</i> (Verreaux)	<i>Zoothera sibirica</i> (Pallas)
<i>C. diphone</i> (Kittlitz)	<i>Z. sibirica davisoni</i> (Pallas)
<i>C. diphone canturianus</i> (Swinhoe)	<i>Z.sibirica davisoni</i> (Hums)
<i>Acrocephalus arundinace</i> Linnaeus	<i>Z.dauma</i> (Latham)
<i>A.arundinaceus orintalis</i> (Tenninck et Schlegel)	<i>Z.dauma aurea</i> (Holandre)
<i>Ohyloscopus fuscatus</i> (Blyth)	<i>Turdus hortulorum</i> Sclater
<i>Phylloscopus fuscatus fuscatus</i> (Blyth)	<i>T. cardis</i> Temminck
<i>Ph. Inornatus</i> (Blyth)	<i>T. merual</i> Linnaeus
<i>Phylloscopus fuscatus fuscatus</i> (Blyth)	<i>T.merula mandarinus</i> Bonaparte
<i>Ph. Borealis</i> (Blasius)	<i>T. pallidus</i> Gmelin
<i>Ph. borealis borealis</i> (Blasius)	<i>T.pallidus pallidus</i> Gmelin
<i>Ph. Tenellipes</i> Swinhoe	<i>T. naumanni</i> Temminck
<i>Ph.uronatus</i> (Temminck et Schlegel)	<i>T.naumanni eunomus</i> Temminck
<i>Ph.coronatus coronatus</i> (Temminck et schlegel)	<i>T.naumanni naumanni</i> Temminck
<i>Seicercus albogularis</i> (Horsfield et Moore)	Zosteropidae
<i>S.albogularis fulvifacies</i> (Swinhoe)	<i>Zosteropso iaponica</i> Temminck et Schlegel
<i>Cisticola juncidis</i> (Rafinesque)	<i>Z. japonica simplex</i> Swinhoe
<i>C.juncidis tinnablans</i> (Slwinhoe)	Ploceidae
<i>Prinia subflava</i> (Gmelin)	<i>Passer montanus</i>
<i>P.subflava extensicauda</i> (Swinhoe)	<i>P.montanus saturatus</i> Steinegr
<i>P.polychoa</i> (Temminck)	<i>P. rutilans</i>
<i>P.polychroa parumstriata</i> (Daridet oustalet)	<i>P. rutilans rutilans</i> (Temminck)
Muscicapinae	<i>Lonchura striata</i> (Linnaeus)
<i>Muscicapa griseisticta</i> (Swinhoe)	<i>L. striata swinhoei</i> (Cabanis)
<i>M latirostis</i> Raffles .	<i>L. punctulata</i> (Linnaeus)
Turdinae	<i>L. punctulata topela</i> (Swinhoe)
<i>Luscinia calliope</i> (Pallas)	Paridae
<i>L.svecica</i> (Linnaeus)	<i>Parus major</i>
<i>L. cyane</i> (Pallas)	<i>P. major artatus</i> Thayer et Bangs
<i>L. cyane cyane</i>	<i>P. Uenustulus</i>
<i>Tarsiger cyanurus</i> (Pallas)	<i>P. superciliosus</i>
	Fringillidae

<i>Fringilla mottifringilla</i> Linnaeus	<i>A. Cervnus</i>
<i>Cardulis sinica</i> (Linnaeus)	<i>A. gustavi</i> Swinhoe
<i>C. sinica sinica</i> (Linnaeus)	<i>A. spinoletta japonicus</i> Temminck et Schlegel.
<i>Cadulis spinus</i> (Linnaeus)	Campephagidae
<i>Eophona persornata</i> (Temminck et Schlegel)	<i>Coracina melaschistos</i> (Hodgson)
<i>E. migratoria</i> Hartert	<i>C. melaschistos intermedia</i> (Hume)
<i>E. migratoria migratoria</i> Hartert	<i>Pericrocotus roseus</i> (Vieillot)
<i>Coccothraustes coccothranstes</i> (Linnaeus)	<i>P.roseus contonensis</i> Swinhoe
<i>C. coccothranstes coccothraustes</i> (Linnaeus)	Pycnonotidae
<i>Emberiza rutilo</i> Pallas	<i>Spizixos semitorques</i> Swinhoe
<i>E. anreola</i> Pallas	<i>S.semitorques semitorquese</i> Swinhoe
<i>E. elegans</i> Temminck	<i>Pycnonotus xanthorrhous</i> Anderson
<i>E. spodocephala spodocephala</i> Pallas	<i>P.xanthorrhous andersoni</i> (Swinhoe)
<i>E. cioides</i> Brandt	<i>P.sinensis</i> (Gmelin)
<i>E. cioides castaneicepe</i> Moore	<i>P.sinensis sinensis</i> (Gmelin)
<i>E. fucata</i> Pallas	
<i>E. fucata fucata fucat</i> Pallas	Coracilliformes
<i>E.chrysophrys</i> Pallas	Alcedinidea
<i>Melophus lathamii</i> (Gray)	<i>Alcedo atthis</i>
Bombycillidae	<i>A.hercules</i>
<i>Bombycilla garrulus</i> (Linnaeus)	Cuculiformes
<i>B. japonica</i> (Siebold)	Cuculidae
Dicruridae	<i>Cuculus canorus</i>
<i>Dicrurus macrocercus</i> Vieillot	<i>C.micropterus</i>
<i>D. macrocercus cathoecus</i> Swinhoe	Anseriformes
<i>D. Leucophaells</i> Vieillot	Anatidae
<i>D. leucophaeus Leucogenis</i> (Walden)	<i>Nettapus coromandelianus</i>
<i>D. hotteentottus</i> (Linnaeus)	Ciconiiformes
<i>D. hotteentottus breuirostris</i> (Cabanis et Heine)	Ardeidae
Cinclidae	<i>Ardea cinerea</i>
<i>Cinclus pallasii</i> Temminck	<i>Egretta garzetta</i>
Motacillidae	Galliformes
<i>Dendronanthus indicus</i> (Gmelin)	Phasianidae
<i>Motacilla cinerea</i> Tunstall	<i>Phasianus colchicus</i>
<i>M. cinerea</i> Tunetall	<i>Bambusicola thoracica</i>
<i>M. flaua macronyx</i> (Stresemann)	<i>Phasianus colchicus</i>
<i>M. flaua macronyx</i> (Stresemann)	Columbiformes
<i>M. alba linnaeus</i>	Columbidae
<i>Anthus mouaeseelandiae</i> (Gmelin)	<i>Columba liuia</i>
<i>A. novaeseelandiae sinensis novaeseeladiae</i>	<i>Streptopelia decaocto</i>
<i>A. sinensis</i> (Bonaharte)	<i>S. Chinensis</i>
<i>A. hodgsoni yunanensis</i> Uchida et Kuroba	<i>S. Orientalis</i>

5. National key protected wildlife list in Kuaijishan Ancient Chinese Torreya Community

I-class national protection of wild plants (1)

Metasequoia glyptostroboides Hu et Cheng

II-class national protection of wild plants (3)

Torreya grandis Fort.ex Lindl

Ginkgo biloba L

Eucommia ulmoides Oliv

International endangered species (2)

Manis pentadactyla aurita Hodgson

Ptyas mucosus (Linnaeus)

I -class national protection of wild animals (1)

Munliacus crinifrons Selter

II -class national protection of wild animals (8)

Falco columbarius insignis (Clark)

Lophura nycthemera fokiensis Delacour

Pucrasia macrolopha darwini Swinhoe

Tyto capensis chinensis (Harttert)

Lutra lutra chinensis Gray

Viverricula indica pallidae Gray

Neofelis nebulosa Griffith

Capricornis sumatraensis argyrochaetes Heude