

Format for Proposals of Candidate Systems

for the

Globally Important Agricultural Heritage Systems (GIAHS) Programme

SUMMARY INFORMATION

a. Country and location : Wannian County in Jiangxi Province, P. R. China
b. Name of the system : Rice Culture System
c. Surface Area : 200 ha
d. Minority Group: N
e. Proponent/Requesting organization : People's Government of Wannian County, Jiangxi Province
f. Through NFPI Centre for Natural and Cultural Heritage (CNACH) of Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences (CAS)
g. Governmental counterparts and other partners <ul style="list-style-type: none">• Local communities• Ministry of Agriculture, P.R. China• Agriculture Department of Jiangxi Province, China

h. Summary (max. 200 words)

Wannian traditional rice is a remarkable old and prototype variety, firstly grown in Heqiao village during the North and South Dynasty (420 AD - 589 AD). Formerly, it is called “Wuyuanzao” and commonly known as “Manggu”. It is a location-specific variety to Heqiao village, and cannot be grown in other areas; It was tested and verified that it can be only grown under the water, soil combination and climate condition in Heqiao village. The traditional rice needs the perennial cold spring water for irrigation, and surrounding forests play a crucial role in soil and water conservation. The surrounding forests and paddy fields are part of the same biodiversity-rich agro-forestry system. The rice is resistant to insects and adapted to low soil fertility. Hence farmers do not need to use chemical fertilizers and pesticides, resulting in a sustainable planting environment and contributing to the biodiversity conservation. Ingenious Wannian people have also documented their experiences in cultivating traditional rice and rice culture since time immemorial. The rice culture is closely related to their daily life, expressed in their customs, food, language, and form an important part of their cultural diversity.

DESCRIPTION OF THE SYSTEM

1. Characteristics of the proposed GIAHS

The origin and development of ancient civilizations are always associated with plant domestication. The emergence of crops is the first great revolution of human development in the history. As a cereal grain, rice is the most important staple food for a large part of the world's population, especially in East, South, Southeast Asia, Latin America, and the West Indies. It is the grain with the second highest worldwide production, after maize. Rice is the most important one of the three major food crops, feeding more than half of the world's people. Therefore, domestication of wild rice has an important significance in development of human civilization.

As China's the most important food crop, rice accounts for 40% of total grain output. The agricultural way of life that centred around rice has played an important part in the China's history. For thousands of years, Chinese have been diligently cultivating their land in the pursuit for favourable harvests. This reliance on the land for many thousands of years accounts for China's strong rural essence. The need for rice production has led the Chinese to pay particular attention to irrigation technologies, improving cultivation. The agricultural way of life, centred around rice, has had a strong influence on the social, economic, political and ideological developments of ancient China. In this sense, traditional Chinese culture may be considered a "rice culture."



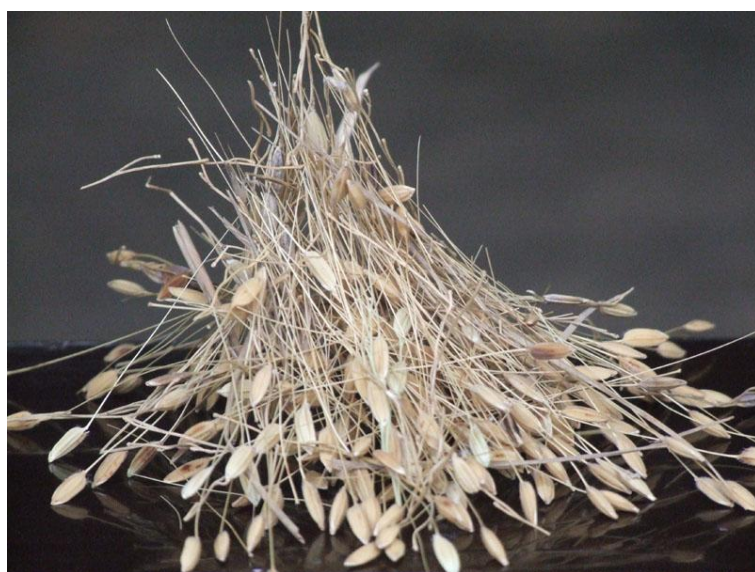
Wannian County is located in the northeast of Jiangxi Province and the lower reaches of Lean River. It is under the jurisdiction of Shangrao City in Jiangxi. Wannian has a long history and splendid ancient civilization. In 1993 and 1995, archaeologists tested and sampled Xianrendong (the left picture below) and Diaotonghuan (the right picture below) in Wannian County. The archaeological research results have provided important material objects for the study of the early Palaeolithic cultures, as well as the origins of pottery and cultivated rice. There is no doubt that Wannian County is one of the origins of rice cultivation.



Scientists believe that the remains of the rice in Xianrendong belong to an ancient cultivation type which evolves to the rice cultivar, whose ancestor is the wild rice in the neighbouring Dongxiang County. Wannian traditional rice has the remarkable characteristics of wild rice and belongs to early cultivation rice variety. This kind of rice formerly called “Wuyuanzao” and commonly known as “Manggu”, has been cultivated in Heqiao Village since the North and South Dynasty. Its morphology is similar with wild rice and its



ancestor is Dongxiang wild rice which is nearby Wannian County. Wannian rice cannot grow in other places except Heqiao Village. According to the research, Wannian Rice requires special water and soil situation and climate. Only Heqiao Village can meet the requirements. As Wannian traditional rice needs perennial cold spring water for irrigation, the surrounding forests play a crucial role in soil and water conservation. The forests and paddy fields form biodiversity-rich agro-forestry systems. Meanwhile, the traditional rice is resistant to insects and adapted to poor soils. Hence farmers do not need to use chemical fertilizers and pesticides, resulting in relatively a good planting environment and contributing to the biodiversity conservation.



Wannian traditional rice and Dongxiang wild rice contain anti-disease, anti-insect, anti-adversity genes and other advantageous genes, especially the cold resistant gene. They provide materials for rice gene research.



Over the long-term of cultivation practice and the improvement of the cultivation, Wannian people have summarized a set of experiences in rice seedlings preparation and transplanting, field management, harvests storage and processing. Correspondingly, the rice culture has been developed in the concentrated expression of the folk custom, food, language and the national characteristics, and the content of local rice culture is extremely rich.

2. Goods and Services Provided by the System

The Rice Culture System in Wannian County provides multiple goods and services for local livelihoods as well as society, including:

1) livelihood services

- Food security: Rice is the staple food of this area. Planting Wannian traditional rice can provide food for local people. And there is no chemicals utilization during the rice growth, so it is green food.
- Health keeping: After test on contents, Wannian traditional rice is of high nutritional value. It contains more protein than ordinary hybrid rice and is rich in microelements and vitamins which are good to people's health. According to the local knowledge, Long-term consumption of Wannian traditional rice could have a certain therapeutic effect on gastro-intestinal diseases. The surrounding forests conserve spring for irrigation as well as clean drinking water.
- Social and cultural services: Wannian traditional rice has a long growth cycle, and compared to hybrid rice, it requires more labour input. So it can be considered to be an effective way to solve the employment problem of rural labour force. Ingenious Wannian people also have documented their experiences in cultivating traditional rice and rice culture since time immemorial. The rice culture is closely related to their daily life, expressed in their customs, food, language, and form part of their cultural





diversity. Wannian, as one of the origins of the world rice culture, has its unique rice-cultivation culture. “Wannian Rice Custom and Production Technology” has been listed into the provincial protection property. It has been also inscribed on “Jiangxi Province Non-Material Cultural heritage Protection Name list”. Wannian rice culture is not only as a way to pass on traditional culture, but also can be used to develop eco-tourism.

The Rice Culture System in Wannian is also educative and can be improved to be the place where students learn about sustainable agriculture. There are ancient cultivated rice remains in Xianrendong and Diaotonghuan sites. Wannian traditional rice can be considered as cultivated wild rice. Their ancestor is the Dongxiang wild rice nearby. This forms a process of evolvement from wild rice to cultivated wild rice, and then to cultivated rice. The genes of Wannian traditional rice and Dongxiang wild rice can also be used in researches. After 1985, with the cooperation research of many domestic paddy rice research units, a series of Wannian rice products have been developed through refinement and rejuvenation of the traditional. Some research about the cold resistant genes of Dongxiang wild rice is already carried out.

2) Environmental services

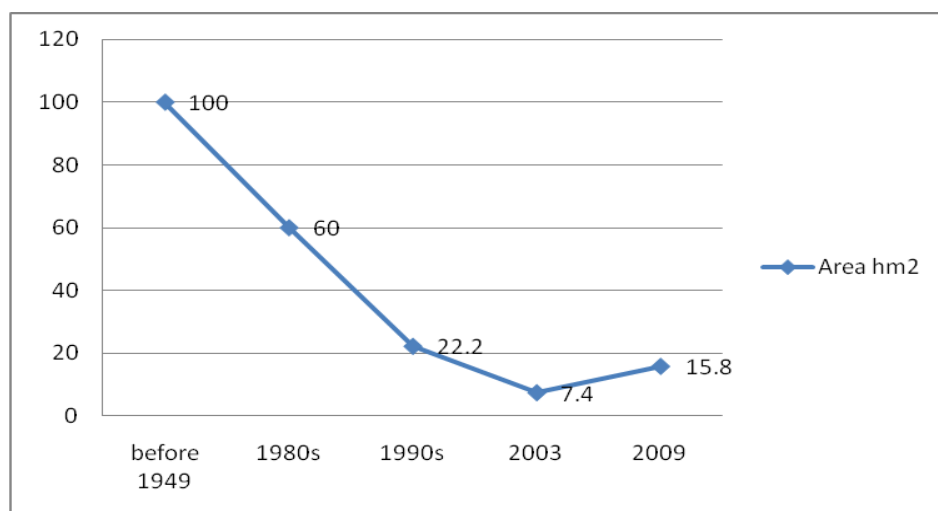
- Biodiversity and ecosystem services: From the microscopic point of view, the genes of Wannian traditional rice and Dongxiang wild rice enrich rice genetic diversity are endemic to the local environment. From a macro point of view, the unique growth environment of Wannian traditional rice forms agroforestry system rich in biodiversity.

- Soil and water conservation and restoration: Forests on the hills around the paddy fields prevent soil erosion and reduce risks of landslides and floods. The paddy fields with forests on its slope serve as watershed to store excessive water and reduce the risk of floods.
- Climate regulation and carbon sequestration: Powered by solar energy through photosynthesis, the biodiversity in Wannian traditional landscape converts carbon dioxide into bio-resources to meet local subsistence needs for food (crops), fertilisers (forest litter and straw).

3. Threats and Challenges

The mineral development around Xianrendong and Diaotonghuan Sites has negative impact on the sites and their surrounding environment, and now there are no relative laws and rules to solve this problem.

Wannian traditional rice is extremely sensitive to habitat, and it cannot grow in other places except Heqiao Village. According to the previous researches, Wannian Rice requires special water and soil conditions and climate. Only Heqiao Village can meet the requirements. The core farming area for Wannian traditional rice had decreased from 100 ha before 1949 to only 7.4 ha in 2003. The government then started to protect the core area since 2003, so the area went up again to 15.8 ha in 2009 (the figure below). But the sown area still has the further reducing tendency.



The change of the area of Wannian traditional rice during last 50 years

There are two reasons for the reduction of the area of Wannian traditional rice. One is the policy which includes returning farmland to forests and extending hybrid rice. The other is the low profit of Wannian traditional rice. It has a long



growth cycle, generally above 150 days, and the output is low, therefore many villagers started to abandon the traditional rice planting. In old days, Wannian traditional rice was only a tribute for the Emperor, but now this system has been abolished. In addition, the traditional rice process technology is being replaced by the modern technology. A survey in Wannian County shows that Wannian traditional rice cultivation system needs more labour than the ordinary rice cultivation because the traditional rice cultivation system is time consuming and the farmers who cultivate traditional rice have no time to go out to make a living. If they plant hybrid rice, they can have some time to go out for seasonal work and make more money.

The functions of food safety, ecological regulation and environment conservation are seriously undervalued. Wannian traditional rice does not need to use chemical fertilizer and pesticide, but its environmental value cannot be reflected by its price. The output of Wannian traditional rice is less than the half of hybrid rice, its price is not as twice as that of hybrid rice while its labor input is more than 3 times that of hybrid rice.

In 2003 the government began to protect the original place of Wannian traditional rice, and then the area went up again to 15.8 ha in 2009. Also with further development of the project Globally Important Agricultural Heritage Systems (GIAHS) in China, the government has growing awareness of the conservation of agricultural heritage and further demand for more sustainable ways of protection. But because of the lack of a unified conservation planning and the shortage of the support

from relevant laws and regulations, the awareness of conservation still remains in the government level, and the awareness of local farmers and community is still relatively poor, so there is no a comprehensive top-down bottom-up form of protection. In this situation, Wannian traditional rice has the risk of extinction.



The Dongxiang wild rice discovered in Dongxiang County in Jiangxi Province in 1978, is considered to be the northernmost-distributed wild rice in the world (at the north latitude of $28^{\circ} 14'$). In the past 20-odd years, due to the damage to ecological environment and the lack of protection, the area of

Dongxiang wild rice has decreased to 1.5 mu (15 mu = one hectare) from the original 60 mu, thus putting Dongxiang wild rice on the brink of extinction.

The modern technology and the change of life style have a great influence on the traditional rice culture in Wannian County. Some traditional farm tools and agricultural cultivation are replaced by modern ones. The corresponding custom and festival are disappearing.

4. Policy and Development Relevance

Now the country has established designations of geographical indications of Wannian traditional rice and protection of the Dongxiang county wild rice original habitat. But the areas of Wannian traditional rice and Dongxiang wild rice are still decreasing. It is necessary to develop the conservation planning and improve relevant policies and regulations.

Public care for food safety and ecological conservation are now being addressed through policies on

monitoring, eco-labelling (Green Food/Organic Food Programs) and eco-agriculture practising. Wannian traditional rice has obtained the national Green Food Certification and now is being applied for the Organic Food Certification. Green agriculture and organic agriculture are good to environment and their high price products will help to improve local farmers' living and make them prefer planting traditional rice to hunting job outside.

The planting area of Wannian traditional rice is declining every year, partly because of its lower economic benefits. So we can adopt eco-compensation mechanism, the government can provide financial compensation and assistance to those farmers who plant Wannian traditional rice in order to enable them to prefer cultivate planting traditional rice. This will ensure the original planting area of Wannian traditional rice does not to decrease, so as to achieve the purpose of the landrace rice species conservation.

In addition, eco-tourism on agricultural landscape is also being promoted. There is good potential to integrate Wannian rice culture into new policy making.

On the other hand, more have to be done to identify and remove inappropriate policies, institutions, and technologies that encourage shifting traditional rice system to hybrid rice systems or forestry.

5. Global Importance

The discovery of the cultivated rice phytolith about ten thousand years ago in Wannian Xianrendong provides extremely strong scientific evidence to prove China is the origin of paddy rice domestication in the world; simultaneously it also



makes very clear that Jiangxi province is the central area for originating paddy rice in China and even in the world, Wannian County, therefore, is also publicly recognized as one of the original areas of paddy rice domestication of the world by archaeologies.

In the 21st century, world agriculture and the development of biological technology for the improvement and perfection of human survival environment and the quality of life will mainly rely on the Genetic Resources. Loss of Crop Germplasm Resources is an important part of the present global biological resources problem. As a result, many good genes are lost forever after billions of years' evolution and accumulation. At present, we are unable to fully predict how to use the genetic resources of these species in the future, but with the rich varieties of genetic resources, human will be able to withstand even greater challenge, to adapt to more living space. Wannian traditional rice is prototype cultivated rice, and some experts believe it is the cultivation type of wild rice. Dongxiang wild rice is the ancestor of this cultivated rice, which is considered to be the northernmost-distributed wild rice in the world and known as the "national treasures" of Rice Germplasm Resources in China. Wannian traditional rice and Dongxiang wild rice contain abundant anti-disease and resisting pests' genes, anti-adversity genes and other advantageous genes, especially genes for cold resistance. They are rare genetic resources in agriculture and meanwhile are both on the brink of extinction.

Advanced rice cultivation and processing technologies with a long history have made Wannian County become a modern rice production and processing base. This not only has a positive role in ensuring food security, but also helps pass on the rice culture.



6. Outline of activities

For dynamic conservation of the system, we need to take following activities:

- Make the relevant policies and regulations for conservation by Government. A sound legal system is an important guarantee for the protection and management of these heritage sites. This will help stop destruction of Xianrendong and Diaotonghuan sites caused by the mineral industry and other damages to the system and support farmers continue cultivation of the Wannian rice.
- Raise awareness of local farmers and communities on Wannian traditional rice and related culture conservation and enhance the popularity of Wannian rice culture after becoming one of GIAHS pilot sites.
- Identify and demonstrate successful adaptations to social-economic changes, and explore the multiple values of the Wannian traditional rice in the food safety, eco-agriculture, eco-tourism and ecological conservation. This will improve profitability of Wannian traditional rice and increase farmers' income, and then they will choose to still plant Wannian traditional rice. This can also attract investment and fund from government and industries to development green or organic food, eco-tourism.
- Develop cooperation on conservation of Wannian rice culture system among communities and local governments.

Until now, some activities, policies and experiences are already ongoing in the area that the project could build upon.

- Wannian traditional rice is documented in National database of crop germplasm resources.
- Xianrendong and Diaotonghuan sites are listed as national protection unit of the point cultural object.
- Now the country has established geographical indication of Wannian traditional rice and protection of the Dongxiang county wild rice original habitat.

- Wannian Traditional Rice Protection Ordinance has been initially formulated by the local government.
- Wannian traditional rice has obtained the national Green Food Certification and now is been applied for the Organic Food Certification.
- Wannian County holds rice culture festival once two years since 2005.

SUGGESTED ANNEXES:

- Maps

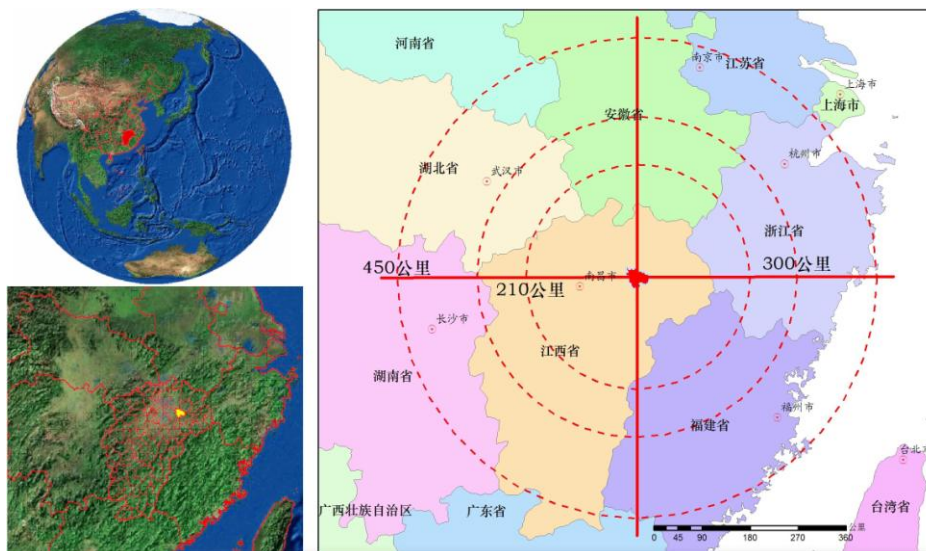


Fig1. The Location of Wannian County

万年大源盆地与东乡野生稻生长地简图

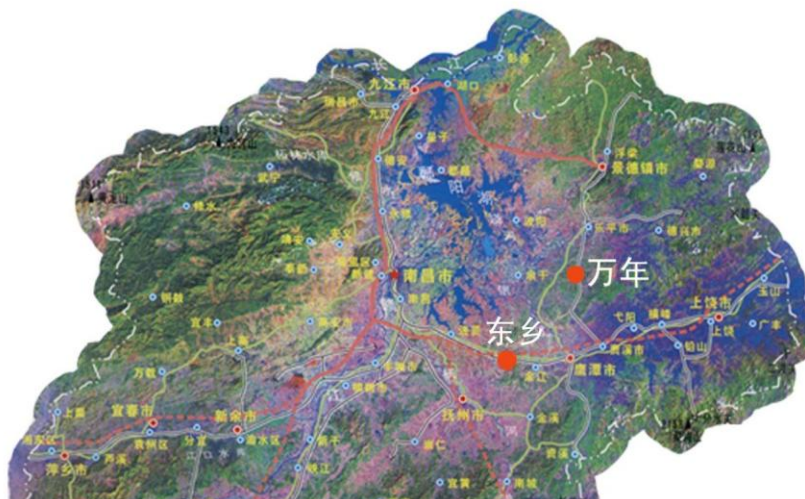


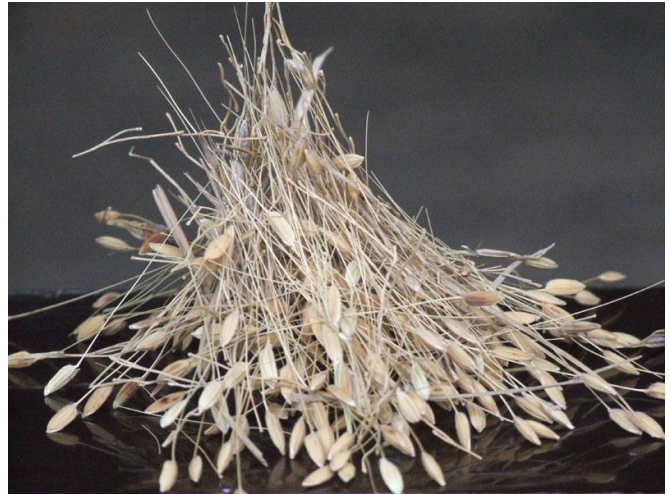
Fig2. The Location of Wannian Dayuan Basin and Dongxiang Wild Rice

- **Biodiversity (species)**

- Wannian traditional rice

Variety Name: Gong Gu

Genus: *Oryza sativa* L. spp. hsien Ting



- Dongxiang wild rice

Dongxiang wild rice is common wild rice (*Oryza rufipogon* Griff.) distributing in Dongxiang in Jiangxi Province of China, originated from the most northern habitat of wild rice, it can endure -12.8°C in winter and has other beneficial characteristics, such as reaction to drought, good quality etc.



- Endangered species in Wannian County are listed below:

National Rare and Endangered Protection Plants
<i>Zelkova schneiderana</i> Hand.-Mazz.
<i>Ginkgo biloba</i>
<i>Cephalotaxus fortune</i> Hook. f.
<i>Liriodendron chinense</i> (Hemsl.) Sarg.
<i>Sassafras tzumu</i> Hemsl.
<i>T.chinensis</i> var. <i>nairei</i> Cheng et L. K. Fu
<i>Michelia longipetiolata</i> C. Y. Wu
<i>Podocarpus macrophyllus</i> (Thunb.)D. Don
National Rare and Endangerous Conservative Animals
<i>Sus scrofa</i> L.
<i>Squama Manis</i>
<i>Tyto alba</i>
<i>Mylopharyngodon piceus</i> (Richardson)

➤ **Common species in Wannian County are listed below:**

<i>Castanopsis Spach</i>	<i>Hibiscus mutabilis</i>
<i>Pistacia chinensis Bunge.</i>	<i>Firmiana simplex</i>
<i>Schima superba Gardn et Champ</i>	<i>Rhododendron decorum Franch.</i>
<i>Pterocarya stenoptera C.DC.</i>	<i>Styrax japonicus Sieb. et Zucc.</i>
<i>Euodia fargesii Dode</i>	<i>Ligustrum quihoui Carr.</i>
<i>Evodia rutaecarpa (Juss.) Benth.</i>	<i>Agastache rugosus (Fisch. Et Mey.) O.ktze.</i>
<i>Sapindus mukorossi</i>	<i>perfla frutescens(l.)britt.</i>
<i>Elaeocarpus sylvestris (Lour.) Poir.</i>	<i>Herba Menthae Heplocalycis</i>
<i>Firmiana simplex</i>	<i>Sabina chinensis (L.) Ant.Chinese juniper</i>
<i>Hibiscus mutabilis</i>	<i>pueraria lobata(willd.) ohwi.</i>
<i>Ficus tinctoria</i> <i>Forest.f.subsp.gibbosa(Bl.)Corner</i>	<i>Indocalamus latifolius</i>
<i>Sinomenium acutum</i>	<i>Trachycarpus fortune</i>
<i>Juncus effusus Linn.</i>	<i>Broussonetia papyrifera L'Her.ex Vent</i>
<i>Uncaria rhynchophylla (Miq.)Jacks.</i>	<i>A. Chinensisplanon</i>

<i>Devil's Rush Herb Herba Junci Setchuensis</i>	<i>Imperata cylindrical</i>
<i>Platycodon grandiflorum (Jacq.) A. DC.</i>	<i>Gastrodia elata Bl.</i>
<i>Aconitum carmichaeli Debx.</i> <i>Schisandra chinensis (Turcz.) Baill.</i>	<i>Lilium brownii var. viridulum</i> <i>Houttuynia cordata Thunb.</i>
<i>Millettiareticulata</i>	<i>Radix Acanthopanax Senticosl</i>
<i>Alangium chinense</i>	<i>StephaniacepharanthaHayata</i>

● Historical and archaeological description of the system or site

Rice is one of the principal food crops in the world. It provides 20% of total calorie supply for the world population. Ninety percent of rice fields distributes in the Asia, and ninety percent of them is wet field, irrigated, rained or floodplains. Upland rice fields accounts only for a small percent of the areas for rice production. Wannian has a long history and splendid ancient civilization. In 1993 and 1995, archaeologists tested and sampled Xianrendong and Diaotonghuan. Their findings offered important material objects for the study of the early Paleolithic cultures, as well as the origins of pottery and cultivated rice.

Wannian Rice, formerly called “Wuyuanzao” and commonly known as “Manggu”, has been cultivated in Heqiao county since the North and South Dynasty.

● **Natural and Socio-economic characteristics of Wannian County**

Wannian County is located in the northeast of Jiangxi Province, which covers a total area of 1,140 km². The topography is high in the southeast, low in the northwest. The highest place is 685m above sea level. Wannian County is affected by the warm and humid subtropical monsoon climate. Mild climate and abundant rainfall constitute the specific conditions of origin of rice culture.

At the end of 2007, the total county population is 381,700, and the agricultural population is 310,000. GDP of the county for 2007 was 28.3235 billion Yuan, and the primary industry accounted for 21.70%, the secondary industry accounted for 44.10% and the tertiary industry accounted for 34.20%. Per capita GDP was 8134 Yuan, respectively lower than that of Shangrao City of 12,562 yuan, that of Jiangxi Province of 8227 yuan. In addition to farming, pearls and concrete production are economically important. There is limited mining.

● **Xianrendong and Diaotonghuan Sites**

Xianrendong site have the upper and lower two different periods of cultural accumulation, the lower one is in the end of the Paleolithic, and the upper is in the early Neolithic. Diaotonghuan site has upper, middle and lower three layers, the lower is the late Palaeolithic, middle is in the end of Paleolithic and the upper is in the early Neolithic. In the two late Paleolithic strata, wild rice phytolith has been unearthed. In the early Neolithic strata, a wealth of wild rice and the cultivated rice phytolith have been unearthed. This shows that, in the years ten thousand years ago, people begun cultivated rice, while gathering wild rice; rice phytolith found in stratum about 7500 years ago is already cultivated rice, which shows that rice agriculture had formed.

仙人洞遗址西区地层稻作植硅石分布示意图

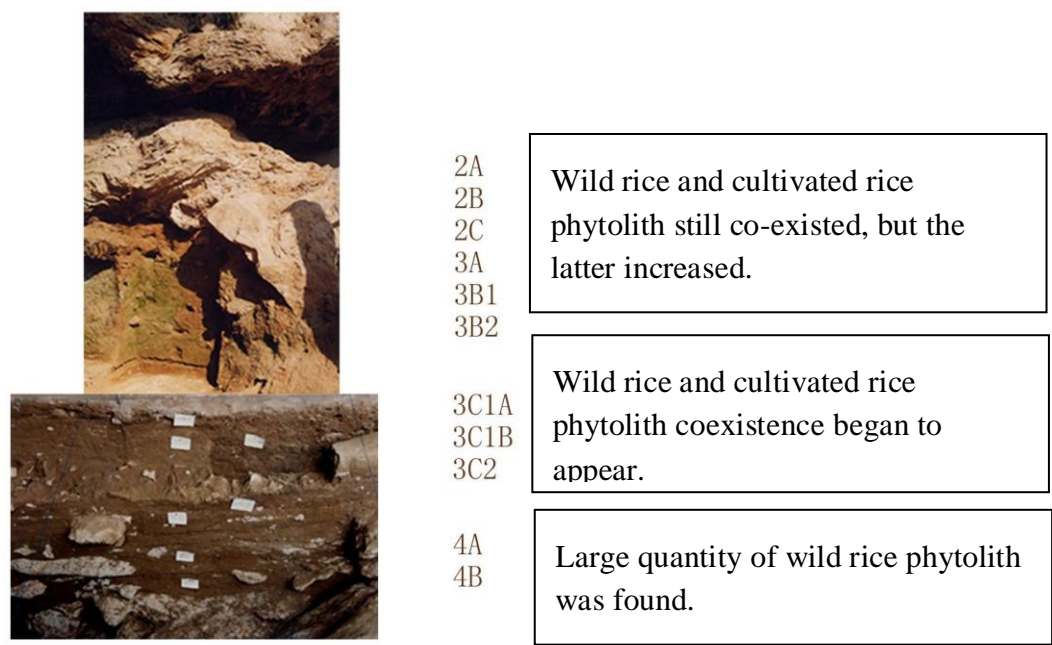


Fig.4 Distribution of rice phytolith in Xianrendong Site

吊桶环遗址地层稻作植硅石分布示意图

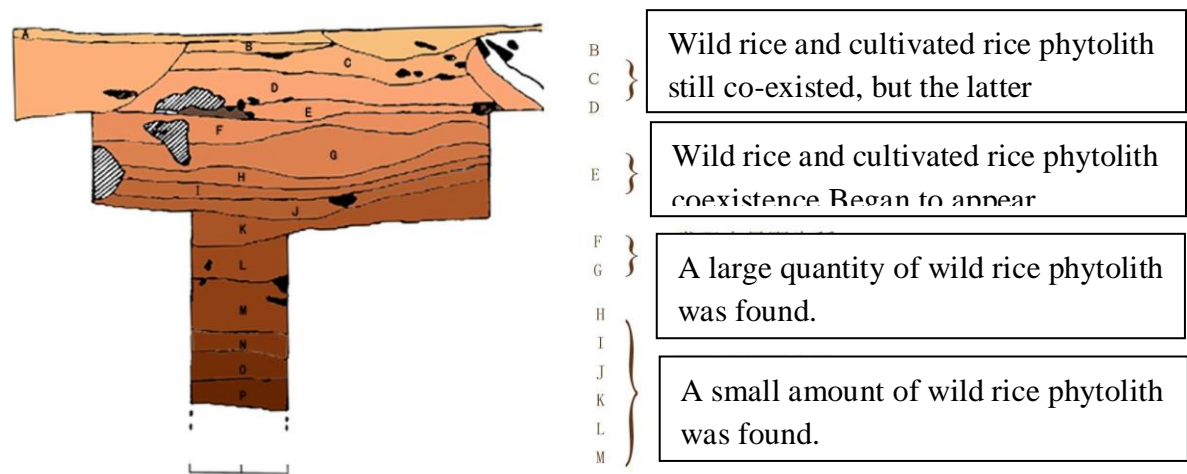


Fig.5 Distribution of rice phytolith in Diaotonghuan Site