GIAHS Proposal

Globally Important Agricultural Heritage Systems (GIAHS) Initiative

Xuanhua Traditional Vineyards System

Location: Xuanhua District of Zhangjiakou City, Hebei Province, China

People’s Government of Xuanhua District

March, 2013
**SUMMARY INFORMATION**

<table>
<thead>
<tr>
<th>Name of the system</th>
<th>Xuanhua Traditional Vineyard System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proponent/Requesting organization:</td>
<td>People’s Government of Xuanhua District, Zhangjiakou City, Hebei Province</td>
</tr>
<tr>
<td>Location: Guanhou village, Dabei village and Penyao village of Chenguang Town, Xuanhua District, Zhangjiakou City, Hebei Province, China</td>
<td></td>
</tr>
<tr>
<td>Accessibility: 150 km from Beijing, 442 kilometers from the provincial capital Shijiazhuang: about 2 hours' drive and 4 hours' on train.</td>
<td></td>
</tr>
<tr>
<td>Total area: 0.49km²</td>
<td></td>
</tr>
<tr>
<td>Agricultural Ecological Zones: the northern semi-arid agricultural areas</td>
<td></td>
</tr>
<tr>
<td>Geomorphological Features: located in the Xuanzhuo Basin of the Sanggan River, the transition zone of the Inner Mongolian Plateau to the North China Plain, 629 meters above sea level.</td>
<td></td>
</tr>
<tr>
<td>Climate Types: Semi-arid Continental Monsoon Climate</td>
<td></td>
</tr>
<tr>
<td>Population: 4680 people in the core area</td>
<td></td>
</tr>
<tr>
<td>The Main Sources of Livelihood: grape plantations/ vineyards</td>
<td></td>
</tr>
</tbody>
</table>
**Ethnic Population:** The majority population is Han (97%), and 25 ethnic minorities such as Hui, Manchu, Mongolian, Korean, Zhuang, Tujia occupy 3% of the population; however the population of three villages is Han.

**Abstract:**

Garden cultivation of Xuanhua milk grapes, with a long history of 1,300 years of cultivation in the local area, and which mainly includes the traditional technology of funnel frames and polyclonal hole-planting methods, has extremely important historical value and cultural connotations. The plantations are mainly distributed in Guanhou village, Penyao village and Dabei village of Chunguang Town, which is already included as one part of Xuanhua City. With the outstanding features of big bead, thin skin, thick pulp, and moderate sweetness, Xuanhua milk grapes are called ‘treasure of the fruits’ and enjoys a high reputation both at home and abroad. The traditional cultivation of milk grapes is also a unique tourism attraction in Xuanhua District.

The Xuanhua traditional vineyard system, a typical example of Chinese garden agriculture, not only maintains the national heritage, but also provides a large amount of materials for scientific research on ecology, economy, society and culture, with its outstanding advantages of enriching biological diversity, changing eco-system, assuring food safety by using peasant household methods, and providing the livelihood sources for local farmers. However, this precious traditional courtyard-style vineyard and its culture are being endangered by encroaching urbanization and are decreasing year by year. This is a call for an urgent conservation.
Contents

I Characteristics of the proposed GIAHS.................................1

1.1 Food and Livelihood Security.................................................2

1.2 Biodiversity and Ecosystem Functions......................................4

   1.2.1 Biodiversity........................................................................5

   1.2.2 Ecosystem functions ..............................................................7

1.3 Knowledge Systems and Adapted Technologies........................11

   1.3.1 Knowledge Systems..............................................................11

   1.3.2 Adapted Technologies ..........................................................12

1.4 Cultures, Value Systems and Social Organizations (Agri-Culture) ........18

   1.4.1 Culture ..................................................................................18

   1.4.2 Value Systems .......................................................................19

   1.4.3 Social Organizations ..............................................................22

1.5 Remarkable Landscapes, Land and Water Resources Management Features......22

II Historic Relevance .................................................................25

2.1 Grape Culture Blending into the Lives of Successive Residents........25

2.2 Becoming a Geographical Indication Products and Expanding Local Popularity ....26

III Contemporary Relevance ......................................................27

3.1 Enriching the Urban Landscape..............................................27

3.2 Promoting Leisure Agriculture Development .............................28

3.3 Adjusting Urban Microclimate ................................................29

3.4 Ecological Civilization Construction ..........................................29

3.5 New Socialist Countryside Construction ......................................29

3.6 Sustainable Development of Agriculture .....................................30

IV Threats and Challenges .........................................................30
4.1 Local Level ............................................................................................................. 31
  4.1.1 Challenges Posed by Urbanization ............................................................. 31
  4.1.2 The Inadequate Aggregation and Difficult Sales of Grape Industry .......... 32
  4.1.3 Reduction of Comparative Advantage and Loss of Labor Force .......... 33
  4.1.4 The Fresh Produce Period is Short, Difficult to Preserve ...................... 33

4.2 National Level ......................................................................................................... 33
  4.2.1 The Lack of Attractiveness of the Development of Grape Industry .......... 33
  4.2.2 The Surge in the Concept of Modern Agricultural Development .............. 34

4.3 Global Level ........................................................................................................... 34

V Practical Considerations .......................................................................................... 35

  5.1 Ongoing Efforts to Promote GIAHS ................................................................. 35
  5.2 Potentials and Opportunities for Sustainability and Management of GIAHS ........ 36
  5.3 Expected Impacts of GIAHS on Society and Ecology ......................... 37
  5.4 Motivation of the Local Community, the Local/National Authorities and Other Relevant Stakeholders ................................................................. 38

VI DYNAMIC CONSERVATION PLAN FOR GIAHS SELECTED SITE .................. 40

SUGGESTED ANNEXE 1 Maps ............................................................................... 61

SUGGESTED ANNEXE 2 Biodiversity of Xuanhua Traditional Vineyards ........ 63

SUGGESTED ANNEXE 3 The History of Xuanhua Grape ....................................... 66

SUGGESTED ANNEXE 4 Photographs .................................................................... 70
DESCRIPTION OF THE AGRICULTURE HERITAGE SYSTEM

I Characteristics of the Proposed GIAHS

Global (National) Importance

The culture of grapes and vineyards has a long history in the world because of its historical value and support for community livelihoods, which has long been the subject of concern. From a landscape perspective, due to different climatic conditions and cultural traditions, vineyard landscapes differ greatly between that of East and West. From the functional perspective, Western vineyards plant wine grapes for making wine, while many of China's Vineyards are dominated by the production of table grapes.

The earliest written records on grapes in China can be found in the *Book of Songs*. The poetic lines in the book reflect that as early as in the Shang Dynasty people began to collect a variety of bryony. The grapes cultivated currently in China can be dated from those brought back by Zhang Qian on his mission to the western regions in the Emperor Wu in the Han Dynasty from the country of Dawan, Central Asia (the Tashkent region of today). The Zhangjiakou region is the oldest Chinese grape-producing area in Hebei Province, and Xuanhua District of Zhangjiakou City is the main white grape production area. According to historical records, the Xuanhua milk grape has a cultivation history of more than 1300 years, and it is the most complete and almost the unique traditional funnel-framed grape producing area. It is located in the semiarid region of northern China and is an intensive use of poor land resources; water shortages, lack of soil, sandy soils and lack of organic material, which reflects the human adaptation to the natural environment. The traditional vineyards in Xuanhua belong to the garden type of agriculture, with grape culture and the daily life of farmers integrated together. Large quantities of vegetables, fruits, some crops and flowers are planted around the courtyard grape grid for supply of life
needs, which increases the region's biodiversity and landscape diversity. Collectively, it shows a diverse, multi-layered stereoscopic landscape with a variety of practical and aesthetic values. As a typical suburban agriculture, its agricultural leisure and landscape maintenance functions cannot be ignored. As the only suburban agricultural heritage site in China at present, the exemplary role of Xuanhua traditional vineyards is outstanding.

However, due to the rapid urbanization of Xuanhua, a sharp decline appears in the number of traditional vineyards, which have been reduced from more than 6,000 Mu to the present level of less than 1500 Mu. At present, all vineyards have been zoned as land for construction by the city construction department, and many farmers’ vineyards have already been leveraged by developers at high prices. At the same time, traditional vineyard plantations require high labor inputs but with low returns; famers have lost confidence in product marketing, and young people are migrating to the cities. All of these trends have serious negative impacts on the conservation of traditional vineyards. The diminution of vineyards means the loss of traditional landscape of vineyards, loss of bio-diversity and cultural integrity. As an excellent and unique vineyard culture located in the suburbs of a rapidly growing city, Xuanhua traditional vineyards need to be conserved urgently.

1.1 Food and Livelihood Security

(1) Fresh Grapes and Grape Products

Grapes have always played a very important role in the agricultural production of Xuanhua and today are the main source of revenue of local farmers. The hopper frame number is about 3.5/Mu, with an average yield of up to 1750 kg (each producing about 500 kg), with an income of up to 12,250 yuan/Mu (calculated according to the price at 7 yuan/kg). According to the national economic statistics for Xuanhua District, in 2009, the grape growing area of Xuanhua District was 193 hectares, the total output reached 3,636 tons, and the earnings reached 25 million yuan. Economic benefits
derived from grapes have made great contributions to the local agricultural economy in terms of output value. The cultivation of grapes has good development prospects in terms of product sales, grape culture and is of great significance in the food and livelihoods system of the local people.

Xuanhua grapes are various and unique with over 40 varieties of grapes like white milk, longans, plums, bananas, Tiger eye, mare's milk and Kyoho grapes. Xuanhua funnel-framed grapes enjoy great prestige with large bodies, thin skin and moderately sweet and sour tasting. The milk grape, its shape like a cow's nipple, is big in size with maximum of up to 2 kg. The color is green and white, just like Jasper crystal, clear and bright, crisp and watery with thin skin and rich juice, tasting sweet and delightful (Figure 1). The greatest feature of Xuanhua grapes’ is that it can be peeled and cut into grape slices without losing the juice. Its nutritional value is very high with sugar content of up to 21%, invigorating the spleen and stomach, diuretic, thirst quenching and helpful for digestion. It is also replenishing for neurasthenia and excessive fatigue.

(2) Garden Vegetables and Fruits

On the open space of the funnel-framed grape yard, a lot of vegetables and fruits are
planted to meet people’s daily life needs. Because in Xuanhua area farmers have very little arable land, crop output of the courtyard is particularly important for them. According to the survey, there are in total 18 kinds of vegetable plants under 7 sections and 14 genera cultivated in Guanhou village vineyards, 19 kinds of vegetable plants under 7 sections and 15 genera cultivated in Dabei village vineyards and 23 kinds of vegetables under 8 sections and 17 genera cultivated in Penyao village vineyards. According to the survey, there are 3 kinds (under 2 sections and 3 genera) of the common cultivation of fruit plants (except grape), in Guanhou village vineyards, 2 kinds (under 2 sections and 2 genera) of the common cultivation of fruit plants (except grape) in Dabei village vineyards, and 4 kinds (under 3 sections and 4 genera) of the common cultivation of fruit plants (except grape) in Penyao village vineyards. In addition, because funnel-framed grapes are grown using traditional planting methods, mainly with the use of organic fertilizers and the minimal use of chemical fertilizers and pesticides, grape quality is superior and safe.

(3) Other Benefits

As the traditional funnel-framed vineyard landscape of Xuanhua is unique and has a very high ornamental value, it can also serve to develop leisure agriculture. This helps to promote the sale of grapes and other related products so as to increase grape farmers' income, promote their awareness of traditional grape source protection, and promote the traditional vineyard conservation to better their livelihoods and welfare.

1.2 Biodiversity and Ecosystem Functions

The biodiversity of Xuanhua traditional vineyards includes diversity of grape varieties, germplasm diversity and related species diversity. Ecosystem functions include biodiversity maintenance, protection of soil and water conservation, climate regulation, and improving the rural environment which could also contribute to tourism development.
1.2.1 Biodiversity

(1) Diversity of Grape Varieties

Xuanhua is extremely rich in grape germplasm, including grapes of White Milk, Longan, Muscat, Seedless White, Lizhamate, Zhana, Kyoho, Pioneer, Igawa, Queen of the vineyard, Green Bananas and Seedless Purple, Phoenix 4 or 12, Tigers Eye, Red Plums, Red Banana, New Rose and Red Heart, etc. There are more than 40 varieties at present (Figure 2). The White Milk grape is Xuanhua’s special product. With a history of over 1000 years, it is renowned worldwide. The cultivated area accounts for about 80% of the total.

Figure 2  Grape Varieties of Xuanhua

(2) Associated Biodiversity

Xuanhua’s traditional vineyards are very rich in biological diversities. In addition to many grape varieties, there are a lot of vegetables, fruits, flowers herbaceous plants (Figure3 & Figure4). A survey of Guanhou village, Dabei village and Pengyao Village found that there are 74 plant species other than grapes (including subspecies and variants) under 29 sections and 57 genera, with the maximum number of species of Cucurbitaceae, accounting for 12.16% of all kinds,
and Liliaceae, Solanaceae and Compositae, listed as the second, reaching 9.46% (see Table 1).

**Table 1  Number of Plant Species and Proportion of Vineyards in the Survey**

<table>
<thead>
<tr>
<th>Section</th>
<th>Number of Species</th>
<th>Proportion</th>
<th>Section</th>
<th>Number of Species</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liliaceae</td>
<td>7</td>
<td>9.46</td>
<td>Asclepiadaceae</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Labiatae</td>
<td>2</td>
<td>2.70</td>
<td>Solanaceae</td>
<td>7</td>
<td>9.46</td>
</tr>
<tr>
<td>Butterfly flowers</td>
<td>1</td>
<td>1.35</td>
<td>Umbelliferae</td>
<td>2</td>
<td>2.70</td>
</tr>
<tr>
<td>Legume</td>
<td>4</td>
<td>5.40</td>
<td>Cruciferae</td>
<td>6</td>
<td>8.10</td>
</tr>
<tr>
<td>Balsaminaceae</td>
<td>1</td>
<td>1.35</td>
<td>Buckthorn family</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Gramineae</td>
<td>2</td>
<td>2.70</td>
<td>Cycas branch</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Cucurbitaceae</td>
<td>9</td>
<td>12.16</td>
<td>Araliaceae</td>
<td>2</td>
<td>2.70</td>
</tr>
<tr>
<td>Mallow family</td>
<td>1</td>
<td>1.35</td>
<td>Cactus family</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Compositae</td>
<td>7</td>
<td>9.46</td>
<td>Amaranthaceae</td>
<td>2</td>
<td>2.70</td>
</tr>
<tr>
<td>Acanthaceae</td>
<td>1</td>
<td>1.35</td>
<td>Convolvulaceae</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Picrasma quassioides</td>
<td>1</td>
<td>1.35</td>
<td>IRIS Division</td>
<td>2</td>
<td>2.70</td>
</tr>
<tr>
<td>Orchid</td>
<td>1</td>
<td>1.35</td>
<td>Mirabilis Jalapa</td>
<td>1</td>
<td>1.35</td>
</tr>
<tr>
<td>Mahogany family</td>
<td>1</td>
<td>1.35</td>
<td>Verbenaceae</td>
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<td>1.35</td>
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<tr>
<td>Canna family</td>
<td>1</td>
<td>1.35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The survey shows that the number of species usable (other than grapes) in the vineyards of Guanhou village is the largest, and that of Dabei village is the second. Because the area of vineyards in Penyao village is smaller, the density of species is the maximum, 0.011/m² (see Table 2).
In addition, there are many species outside the courtyard in the Xuanhua District, which include crops and trees, food crops such as millet and corn; And trees include (1) shelter: the species mainly of Pinus tabulaeformis, platycladus orientalis, and larch, Aspen, birch, willow, Elm; (2) forest: tree species mainly of poplar, willow, Elm, Huai; (3) non-timber forest, tree species mainly in grapes, olive like dates, apples, pears, peaches and other non-timber forest species. In addition, Xuanhua has some rare and protected wildlife, mainly are shown in annex.

### 1.2.2 Ecosystem Functions

**（1）Biodiversity Maintenance**

The Xuanhua traditional vineyards have created a rich eco-niche, providing conditions for species coexistence and forming a very rich biological diversity. Genetic diversity and species diversity of traditional vineyards has a high genetic value. Funnel-framed grape frames take up a smaller land area compared to the normal type of grape frame, providing space for the growth of other species. At the same time, funnel type grape frames form shady environments in the yard, providing a suitable environment for shade plants; Irrigation canals form an environment similar to a wetland and create the appropriate conditions for moisture absorption for plant growth.

Richness of species diversity is not only closely related to the environmental conditions created by the funnel type grape frame, but also closely related to traditional planting methods of funnel-frame grapes. Around each funnel grape frame

<table>
<thead>
<tr>
<th>Name</th>
<th>Household</th>
<th>(m²) Vineyard Average Area</th>
<th>Average Number of Species</th>
<th>Number Density of Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanhou village</td>
<td>10</td>
<td>1 333</td>
<td>12</td>
<td>0.009</td>
</tr>
<tr>
<td>Dabei village</td>
<td>8</td>
<td>1 416</td>
<td>10</td>
<td>0.007</td>
</tr>
<tr>
<td>Penyao village</td>
<td>12</td>
<td>800</td>
<td>9</td>
<td>0.011</td>
</tr>
</tbody>
</table>

**Table 2 Number of species in vineyards**

Figure 5 Malan flower
is planted a large number of Malan flower (see Figure 5). In addition to its important ornamental value, the slender leaves of Malan flower can also be used to bundle the grape frame. Malan leaves can be used as a rope as it can be made easily; On the other hand, when dismantled in the winter, Malan leaves have dried up and they are easy to remove. Removed Malan leaves can also be used as fertilizer mixed in the soil. It does not produce wastes and garbage arising from the rope made from other materials.

(2) Soil and Water Conservation

Funnel-framed grape ecosystems will maintain soil functions mainly for precipitation interception. It will weaken the direct impact of raindrops on the surface and limit erosion, while well-manured soils will have high permeability and moisture-holding capacity. It will reduce surface runoff, speed, fixing of soil by roots, effectively reducing soil erosion. Soil porosity determines its water-retention capacity, and non-capillary gap of the funnel-framed grape soil is the main place to store rainfall. Funnel-framed grape ecosystems use less pesticides, prevents the loss of nutrients such as nitrogen, phosphorus and potassium, improves soil quality, reduces soil erosion, and has a certain function of soil conservation and water conservation services.

(3) Regulation of Climate

Traditional vineyards have prominent features of climate regulation, and serve as a good adaptation and improvement to local climate amelioration. Funnel type grape frames mainly appear in the farm courtyard, its large canopy covering the entire courtyard and forming a unique microclimate environment. Grape canopy plays a role on absorption and reflection of solar radiation in the courtyard, reducing the intensity of solar radiation and atmospheric temperature significantly. According to the measurement, in the sunny morning of August, solar radiation in the normal yard is over 1000 lux, while solar radiation in the yard with funnel-framed grapes is only 100 lux. The atmospheric temperature of the latter is 1°C lower than that of the former, in the afternoon, the temperature difference of 2°C or more. At the same time, transpiration of funnel-framed grapes is abundant. The air humidity in the yard with the funnel-framed grapes is significantly higher than that of the normal courtyard. On a sunny morning in August, the relative humidity of the former is about 6% higher
than that of the latter, and over 20% in the afternoon. From several meteorological index averages during the day compared between courtyard with funnel-framed grapes and ordinary courtyards, the yard with funnel-framed grapes has many living advantages (see Figure 6). The yard with funnel-framed grapes forms, in hot summer, low radiation, low temperatures and high humidity so that people find it refreshing and pleasant to work and relax there.

In addition, the vineyard is an artificial ecosystem under intensive management. The ecosystem plays an important role in regulating atmospheric CO$_2$, and is important for effective mitigation of global climate change. First of all, because funnel-framed frame grape vineyards are under economic management, with grapes growing with high productivity, that absorb large quantities of CO$_2$ by strong photosynthesis and will act as a carbon sink. Secondly, because the grapes are of longer life expectancy, grape plants store carbon to retain a longer period of time, thus a function of carbon is more obvious. In addition, the grape growing process needs extensive pruning, a great deal of trimming and litter is returned to the soil to supplement the loss of soil organic carbon, and vineyard soil forms an obvious carbon pool.
Figure 6  Impact of funnel-framed grape frame on meteorological parameter of courtyard

(4) Improving the Rural Environment

Funnel-framed grapes have continued the traditional methods of planting, mainly using human and animal feces and other organic fertilizers to form a soil nutrient cycling process of soil-grapes-human (animal)-soil in the garden. Each frame of grapes requires organic fertilizers of about 1400 kg in one growing season. A lot of organic fertilizers will not only maintain soil fertility and productivity of vineyards (making it possible for 600-year old vineyards to maintain a high level of production), but also to ensure the excellent quality of milk grapes. The extensive use of organic fertilizers makes human and animal excrement in rural areas adequately dealt with.

(5) Landscape Leisure Function
Funnel-framed grape culture has a long history, and its unique and beautiful shape is highly ornamental, so traditional vineyards have an attractive landscape and leisure function. Funnel type frames create a comfortable microclimate environment providing a location suitable for leisure. In addition, funnel-framed grapes are of a good quality, mainly including milk grapes, its skin being thin, with moderate sweet and sour levels and tastes good. It has been famous since ancient times and has a very substantial market. Therefore, the funnel-framed grape has its unique character in history and culture, landscape and taste and is an important cultural and landscape resource with a variety of factors for the development of the tourism and leisure industry. On the basis for its essential protection, we will outline an original combination of both cultural advocacy and the development of leisure agriculture, providing resources for leisure agriculture development, and effectively driving the employment income of farmers to promote local economic and social development.

1.3 Knowledge Systems and Adapted Technologies

1.3.1 Knowledge Systems

The development of the vineyard's biological diversity is inseparable from people's daily needs and gradually form rich traditional knowledge. For example: In Xuanhua area, every family plants Malan flower, which can both make full use of the courtyard's space and supply the ideal material banding the grapes. Farmyard manure (human excrement) is traditionally used in the grape planting, which can not only change the wastes into fertilizer, reducing chemical fertilizer and increasing the safety of the grape products. A variety of fruits and flowers grown around grapes frames not only satisfy the daily needs of the peasant family but also increase the biological diversity of the courtyard.

Grape cutting is usually started in the latter September. By using light and

Figure 7  Garden Landscape &Biodiversity
small scissors, people need to hold the bottom of the fruit with one hand and cut the stem with the other hand, with the tips of scissors’ not hurting the grapes. Once fallen to the ground, grapes will be called "broken". One person cutting and the other packing is the common practice (Figure 8). In the old days, during grape harvest season, dealers wandered through the streets selling the grape beads fallen from the bunch when cutting, and kids would buy with small change.

![Figure 8  Traditional Way of Picking Grapes](image)

Farmer households create some natural methods like hanging colorful cloth strips, mirrors or discs to protect the grapes from bird damage, and some others cover the trellis with a big net on for protection. (Figure 9)

![Figure 9  Traditional Ways of Protection from Birds](image)

1.3.2 Adapted Technologies

(1) Xuanhua traditional management technology of milk grapes includes:

Unearthing the Grapevines, Bud Picking and Branch Fixing: Because of cold temperatures grapevines cannot come out from the soil too early and the proper time
is around Qing Ming Festival. If too early, with the low ground temperature, big winds in early spring, the branches will easily dehydrate and the germination will be badly influenced. The trellis for the grapes is built with internal and external poles, forming 35~40°angles with the ground, which is the best for prostrate frames for the mature grapes, and good for lighting sources and synchronization for the grapes both on and under the frame, as well as advantageous for pest control. From budding to shooting, when the types of inflorescence can be forecast, picking buds occurs two or three times. In the windy or spacious areas, bud picking can be postponed. When fixing, fruit branches of the milk grapes, especially those close to the root of the mother branch.. Branch fixing should be done in two or three times when the new bud grows to 15~20cm.

**Tip Tied with Topping:** In mid-May, when a small amount of shoot grows to 30 to 40 cm, the 1st tip-tie should be done. Milk grape shoots are very tender and the tip should be tied on sunny days during 10:00 to 17:00. During this period, tip tying should be done about 3 to 4 times a year, when branches are flexible and not easy to break.

**Flower and Fruit Thinning:** Flower and fruit thinning control the yield at 1500 to 1700 kg / mu, which is an important measurement to ensure fruit quality and stable quantity. Many careful actions and appropriate timing are required during this phase.

**Topping:** Tips are extended in early July and 18 to 20 leaves are kept for topping; topping of the weak grower should be done before spray should be done at once and should be bagged flower, leaving more than 10 leaves.

**Winter Pruning:** Combined methods of pruning long, middle and short tips. Extended branches are generally done by long shoot pruning to keep more than 8 buds.
(2) Xuan Hua traditional vineyard's soil and water management technology mainly includes the following sections:

- **Deep soil loosening and moisturizing:** Loosening and moisturizing soil by fertilization and irrigation, removing the unwanted sprout from the fertilization pit.

- **Pit Expansion and Fertilization:** It can be done once in late August every 3-4 years together with fertilization.

- **Irrigation and Drainage:** Generally, one fertilizing, one watering. In addition, timely and appropriate watering should be done according to the soil conditions and tree's demand for water.

- **Spread Fertilizer in Cave and Loosen Deep Soil:** Covering fertilizer is usually a taboo of fruit tree fertilization; but in sandy soil conditions, covering and spreading fertilizer is advantageous for roots to absorb nutrients.

(3) Characteristics of Xuanhua traditional grape planting techniques include:

**Colonization:** Every spring (mid to late April). After germination shoots grow in radiation to the surroundings and form the funnel frames.
- **Phoenix Table:** The central part of the Funnel-framed vineyard. Phoenix table facilitate farmers' management on the funnel-framed grapes.

- **Tie:** With the growth and extension of the grapes' vines, the branches can be placed evenly on bevel shelves, and Malian grass is used to tie the twigs to the rod, beams, sticks, and sub-stick. Malian grass is green, simple, convenient and economical.

![Figure 13 Tie the vines of grape](image)

- **Hollow Buried vines in Cold Winter:** after winter cutting, grapes dendrite are placed into the cold-proof trench, racks removed, and the removed material can be used for the planting pit and the round table to, support the soil. Then spread a layer of straw (now the cloths strips), then cover with a layer of soil and finally complete bury of soil before the beginning of winter. Air is smartly and skillfully used to prevent the coldness, by which, temperature is 5 °C higher at the bottom of the ditch than solid bury. Also, it has the advantages of thermal insulation, moisturizing and permeability, without hurting the emerging buds.
Figure 14 Hollow Buried in Cold Winter

- The Funel-framed Scaffolding (Figure 15)

Figure 15 Funnel Framing

(4) Funnel Frames' Advantages Compared With Bent Frames

- **Light Intensity:** Light intensity is successively diminished on the upper, middle and lower rack of both the two trellises. In the four directions, east, south and west of the funnel frames, every day from morning to night light intensity changes greatly, and for some time, the light intensity is close to direct sunlight; while the tilting shed doesn't have such strong light periods. But in the north of
funnel frame, light intensity throughout the day is relatively weak; and the west part of both funnel frames and tilting frames enjoy the strongest light intensity.

- **Fruit Quality:** The quality of the fruit is mainly measured by the shape. As can be seen from Table 3, the fruits on different part of the funnel frames vary greatly, which become more obvious in the production phase.

  Table 3  **Research on the Fruits of Different Parts of the Two Frames**  
  (2009-09-26)

<table>
<thead>
<tr>
<th>Frames</th>
<th>Average Weight/Bunch (g)</th>
<th>Average Weight/Bead (g)</th>
<th>Vertical Diameter/Bead (cm)</th>
<th>Horizontal Diameter/bead (cm)</th>
<th>Content ofSoluble Liquid (%)</th>
<th>Content of Fruit Acid (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funnel Frames</td>
<td>610.26</td>
<td>5.92</td>
<td>2.52</td>
<td>1.75</td>
<td>16.2</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>806.33</td>
<td>6.88</td>
<td>2.95</td>
<td>1.96</td>
<td>15.6</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>862.31</td>
<td>7.11</td>
<td>3.16</td>
<td>2.09</td>
<td>13.2</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>761.21</td>
<td>6.31</td>
<td>2.66</td>
<td>1.89</td>
<td>16.5</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>810.26</td>
<td>6.88</td>
<td>2.71</td>
<td>1.92</td>
<td>15.8</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>816.22</td>
<td>7.02</td>
<td>2.86</td>
<td>1.98</td>
<td>14.2</td>
<td>0.49</td>
</tr>
<tr>
<td>Tilting Frames</td>
<td>761.21</td>
<td>6.31</td>
<td>2.66</td>
<td>1.89</td>
<td>16.5</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>810.26</td>
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<td>15.8</td>
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</tr>
<tr>
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<td>816.22</td>
<td>7.02</td>
<td>2.86</td>
<td>1.98</td>
<td>14.2</td>
<td>0.49</td>
</tr>
</tbody>
</table>

- **Volume of Production:** Production is an important indicator to measure a frame. Table 4 shows that the production of the two racks has no obvious difference. However, the funnel frame has more stable production than the tilting frame.

  Table 4 **Questionnaire of Production of Two Frames/Mu**

<table>
<thead>
<tr>
<th>Frames</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funnel Frame</td>
<td>1367.2</td>
<td>1892.1</td>
<td>1386.6</td>
</tr>
<tr>
<td>Tilting Frame</td>
<td>1132.6</td>
<td>2035.2</td>
<td>1235.8</td>
</tr>
</tbody>
</table>

- **Labor and Water Used:** Amount of water used for funnel frames is 40% less than the tilting frames; but the labor used is greater than the tilting frames. (Table 5)

  Table 5 **Questionnaire of the Labor and Water Used for the Two Frames (2009)**

<table>
<thead>
<tr>
<th>Frames</th>
<th>Labor/Mu/year</th>
<th>Watering (Hour/Mu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funnel Frames</td>
<td>52.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Tilting Frames</td>
<td>41.2</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Diseases: Table 6 shows the two frames have no big differences on frost, mould and disease.

Table 6 Questionnaire of Frost, Mould and Disease of Two Frames (2009)

<table>
<thead>
<tr>
<th>Frames</th>
<th>July 30</th>
<th>August 30</th>
<th>September 30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent-age of Diseased Leaf (%)</td>
<td>Disease Index</td>
<td>Percent-age of Diseased Leaf (%)</td>
</tr>
<tr>
<td>Funnel Frames</td>
<td>1</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Tilting Frames</td>
<td>2</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

Required Amount of Soil: Table 5 shows the soil body required by the roots of funnel frames is only 50% of the tilting frames. It is clear that the roots of the funnel frames are highly concentrated, from which we can also see that the amount of required soil used for the funnel-framed grapes of is only 50% of the tilting frames. This is good for the development of the grapes in the barren hills and saline land.

1.4 Cultures, Value Systems and Social Organizations (Agri-Culture)

Xuanhua traditional vineyards, providing a way in life to adapt to nature, have a high social value of cultural heritage. Xuanhua agricultural heritage system ensures food security, improves the lives of farmers and increases employment. Therefore, promoting the development and protection of agricultural heritage system will strengthen the fusion of various types of national culture. Xuanhua milk grape farmers generally inherited the family vineyard with a planting history of more than 200-300 years. Originally limited by the natural conditions, the farmers have, over time, formed a specific mode of production which has adapted to nature and provides livelihoods for local people.

Xuanhua agricultural heritage system is a deep culture accumulated in history and the derived culture and eco-cultural system closely relates to other systems like village
etiquette, customs, folk literature and art, diet culture, manners and historic memories, etc. Over time, these have been incorporated into major social and personal cultural behaviors like local traditional productions, local knowledge, festivals and life styles. It is a treasure not only for the country, and nation, but also for the world and mankind.

1.4.1 Culture

As crystallization of human wisdom and valuable wealth, the Xuanhua grape growing system is an important part of world culture. Xuanhua grape varieties, especially the white milk grapes enjoy a high reputation, which can also be seen from a masterpiece of historical celebrities, among whom the poet Liu Yingyong once had a poem praising white grapes in Valley County as "grapes mature in Autumn, Chinese herbaceous peonies blossom on Spring trees" The local cultural life is rich in the vineyards of farm households.

Xuanhua ancient vineyards form a rich agriculture in the long-term cultivation, which integrates into all aspects of local people's lives. For instance, in Xuanhua grape fertilization, the grapes are usually manured using human manure instead of chemical fertilizers in grape roots. The washrooms in some larger vineyards are separated into men's and women's, only men's excrement is used to fertilize grapes, and the women's excrement is used in vegetables and other crops. In addition, every step of grape cultivation, such as unearthing grapevines, bud picking and branch fixing, end tying and top pinching, flower and fruit thinning, winter pruning and pit expansion and fertilization, is operated by the local farmers in a unified way according to temperature and rainfall conditions in that year, which forms a well-considered grape cultivation calendar.

1.4.2 Value Systems

(1) Culture and Spirit. The age-old ancient vineyards are handed down from ancestors, combining history, witnessing the grandparents working hard on the land,
and also feeling the fruit growers’ deep attachments. The funnel grape can live more than 600 years. The old vine is the Soul of Xuanhua, witnessing the persistent development of the ancient city. As a witness to history, the grape seeds in the unearthed cultural relics of Liao Dynasty in the ancient city not only give people a rich sense of history the vineyard contains, but moreover add to the local populations a sense of identity and pride.

Xuanhua District government held its first "Grape Festival" in 1988, during which the chefs from Xuanhua Hotel and Huiyou Hotel cooked expensive dishes dominated by grape material, known as the "wine dinner " . The Master of drama Cao Yu wrote a poem for the Xuanhua grape: "Xuanhua grapes taste fresh, tender sweet as green milk dropping; far to the north of the Great Wall, where the sad bugles heard in the fall, on my 80-year age I feasted on the delicacies, ending the dream of my whole life". Xuanhua later held the second and the third Grape Culture Festivals which attracted many tourists to visit. So far, there is a street lamp made by grapes in front of Xuanhua Hotel. The cultural activities such as Grape Festival organized by the ancient vineyards in Xuanhua are the results of the inheritance of thousands of years of cultivation and the production of grape culture, and, in turn, can awaken the public to respect the traditional culture so as to promote the protection and development of ancient vineyards.

(2) Art. The typical funnel type grape frame is not only a traditional cultivation technology for grape growing, but provides a leisure and recreation place for people to relax and live comfortably. Its shape is a unique artistic creation carrying a national memory of the very old civilization, enriching national culture and implementing the world cultural diversity. Some shops in Xuanhua currently still sell the art of grapes.

(3) Construction of Harmonious Society. The local support for Xuanhua grape cultivation and Demonstration Park construction has a positive effect on balancing urban and rural development and the development of urban-rural Integration. The development and the protection of the ancient vineyards make a significant
contribution to the study of grape cultivation. Scientific management and protection promotes the sustainable development of enology industry, maintaining a good social order, and creating a harmonious social environment.

(4) **Legend.** In Xuanhua city there are many legends about grapes, such as the legend of Zhang Qian’s diplomatic mission to Xi yu (western regions) introducing the grape to the central plain, the legend of white grape king, and the king of Li Chuangwang and the grapes banquet, all fully showing the importance of grapes in the hearts of Xuanhua people. Xuanhua milk grape planting techniques, at the same time, have been identified as the protective objects of intangible cultural heritage at the city level.

(5) **Folk Etiquette.** At the moment, Xuanhua grapes have become the essential items of local people's gifts on traditional Chinese Spring Festival and other special occasions. Every time when grapes mature, they will be given as important gifts to express the emotions among people (Figure 16). The local grape seed oil produced in Xuanhua is very popular with the locals, and also loved by many people from other places. Meanwhile, in Xuanhua there are shops selling artistic paintings about milk grapes made with wheat straw, explaining that the grapes have become an important part in local people's lives.

![Image of Xuanhua Grape Seed Oil](image)
1.4.3 Social Organizations

In the long-term feudal society of China, the small-scale peasant economy and big family structures were important features of ancient Chinese life. The basic unit of social organization was big family, which meant four generations under one roof, and this conception was regarded as an important part of family happiness and a growing family in China since ancient times. In this case, the courtyard where a family of grandfather, father, son and grandson held activities became an important venue for family life. This type of family structure and the relative isolation of society organizations make Xuanhua funnel-framed grapes cultivation mainly in the courtyard a cultural landscape and be handed down and preserved for generations. Meanwhile, the characteristics of self-sufficient small-scale peasant economy determines that the vast majorities of farmers have to produce their own food supply, and so there are grown some vegetables and fruits under the grape trellis, and this objectively increases the biodiversity and landscape diversity of Xuanhua ancient vineyards. However, with the accelerated process of urbanization, the traditional Chinese living courtyards in the north which have existed for thousands of years are being replaced by modern buildings with a uniform style. The important agricultural forms as Xuanhua traditional vineyards are facing a serious threat.

1.5 Remarkable Landscapes, Land and Water Resources Management Features

Here, landscape is used in the micro-landscape sense comprising a series of courtyards in a village landscape. Critically, this landscape of villages and courtyards is largely within the city walls of Xuanhua and forms an ‘oasis’ of green food production in the midst of an urban-industrial environment.

Different from the bent frame found in other areas, the cultivation of Xuanhua milk grapes are on a funnel round frame forming a unique landscape (Figure 17). The Xuanhua Funnel-framed grape is almost the only funnel-shaped grape planting
method remaining in China. This kind of frame began in the year 907, the period of Liao and Jin Dynasties. The under-part of the frame is small and gradually extends into the air, which is unique both in the use of soil, water, fertilizer and climate due to the shape of the frame. The shading effect of the funnel-shaped frame, in the heat of summer, forms a cool and pleasant microclimate in the courtyard, which provides a comfortable work place for residents and a pleasant visiting place for tourists.

The funnel-framed vineyard is a unique structure being "square inside and round outside". The so-called "square inside" refers to the support arranged in the form of a square; and "round outside" refers to a three-dimensional surface as a whole funnel-shaped slices. The frame is radial slanting 30~35 degrees upward. The frame root is 30cm high, and the frame end is 3 meters high. The scaffolding surface is 10~15 meters in diameter and the hole in frame root center is 2.5~3 meters in diameter. 3-4 racks can be planted per acre. This kind of frame reflects China's ancient concept of "round heaven square earth", and also reflects the traditional inheritance of wisdom.

Funnel-framed structure: a case study of three-circle frame. A full funnel frame sets a total root pole of 4, the second-row pole of 8, the corner pole of 4 and the leading pole of 16. Looked down from the sky, the frame forms a regular 16-sided radial pattern, and seen from the ground, the poles arrange in rows and columns horizontally, vertically and diagonally. Spaces between columns average 2.8 meters, and every four poles form a 9m² square. Downstream and beams along the root poles above diagonal form different size of funnels (Figure 18). Funnel frame advantages: 1) it can
concentrate solar energy, fertilizer and water resources, resist wind, save water and fertilizer; 2) it needs less soil than other frames. Studies have shown that the development of one Mu of funnel-framed grapes requires only half the soil of the development of tilting grape frame; 3) it saves water. Tests indicate that watering funnel-framed grapes can save 40% more water than watering the same area of tilting frame grapes; 4) high yield and good stability; 5) aesthetic frame appearance, reasonable intercropping and use of space and work activities under the frame.

![Figure 18 Structure of Traditional Funnel Frame](image)

Farmers also plant a variety of crops and flowers around the funnel frames, forming an attractive landscape of an agricultural ecosystem because of the rich biodiversity. The different sorts of plants form different hierarchies and scales of landscape, such as the planar vegetable fields, linear trees, dotted individual plants and so on, providing a good habitat at the same time for the survival of animals and bees in the courtyard. Xuanhua is the central place between the North and South of Chinese national culture. Cultural heritage is very rich. Natural courtyard peasant lifestyle accumulated for thousands of years raising Xuanhua milk grapes so that they enjoy high ornamental, historical and cultural value, and also become a major cultural landscape for Xuanhua sightseeing.
Xuanhua unique soil and water resources management accelerates the formation of the Xuanhua traditional vineyard landscape. In order to save water and soil in a semi-arid environment and be easy to manage, Xuanhua people built a "Phoenix platform" and excavated the diversion facilities around the vineyards, reflecting the concept of sustainable development on water and soil resources management in the traditional funnel-framed grapes in the courtyard. Water can be saved in irrigation and the amount of soil you can be reduced. The experiment shows that funnel - framed grapes use 40% less water than tilting-framed grapes. In addition, the development of funnel frame requires only 50% of the soil than the tilting frame, which is most important for the poor conditions of this land of barren hills and saline land.

II Historic Relevance

2.1 Grape Culture Blending into the Lives of Successive Residents

Milk grape is featured product of Xuanhua and gets its name from its similarity in appearance to a cow’s nipple. Xuanhua grape has a long history with more than 1300 years of cultivation. It is said that the first frame of grapes in Xuanhua was in the Maitreya Temple, where the grapes were introduced by a monk and later were gradually planted around the farm house for food and shade and ornament. Xuanhua grape was mainly grown in the temple in the Tang Dynasty. Dian Qi Annal of the Xuanhua government annals records that the Maitreya Temple was located in the north of Xuanhua city, where the flat terrain, fertile land, adequate water of the Liuchuan river for irrigation supply made it the best region for the growth of grapes. In 1993, grapes and wine were unearthed from Zhang Kuangzheng’s tomb made in the Liao Dynasty. According to the historical records, the poet Liu Yingyong of the Jin dynasty wrote the poems entitled Upper Valley as "grape matures in autumn, Chinese herbaceous peony blossom on spring trees ". After the Jingzhang railway was opened to traffic in 1909, Xuanhua grape planting started to develop rapidly.
2.2 Becoming a Geographical Indication Products and Expanding Local Popularity

In 1900, Empress Dowager Cixi and Emperor Guangxu came to Xuanhua, after tasting milk white grapes, they praised it "this tastes fine in the fruits and is indispensable in the court ". In 1909, Xuanhua milk grapes were sent by the Qing government to attend the "World's Fair of Panama " and awarded the " Product of Honor ".

In 1920s-1930s, Xuanhua developed the largest area of grapes up to more than 10,000 frames with annual output of more than 3 million Jin, selling to "Beijing, Tianjin, Zhangjiakou, Tatung, Jining, Suiyuan, Baotou from east to west, and reached as far as Southeast Asia and foreign countries". As well as the local buyers, merchants from Beijing and Tianjing also came to Xuanhua to purchase grapes on the ‘Limit of Heat’ when the grapes mature.

After liberation, Xuanhua grapes became best sellers in the world markets. After Chinese reforms and opening up, Xuanhua could not satisfy the domestic demands of grapes and had to stop the exports due to the improvement of people's living standards and the limit of plantations. Since the establishment of the PRC, Xuanhua successive administrations have attached great importance to the cultivation of grapes, and established Xuanhua Institute for Grape Research which facilitates the study and development of Xuanhua grapes. In 1988, there were 1581 Mu of old grape parks with 5,699 frames of grapes, and later this increased to 600 Mu. In order to get a high and stable yield, the Xuanhua Institute undertook many scientific studies on the aspects of grape ripening, preserving, pest control and quality assurance, etc. and at the same time made reforms in the management of technology diffusion so that the yield per unit area improved very significantly. From 1988 to 1994, Xuanhua district authorities and government held seven "China Xuanhua Grape Festivals" to expand the impact, and achieved good economic and social benefits. Xuanhua grape won the
famous-brand product on the first agricultural fair in Hebei Province in 1997, and once again won Bronze Award at Kunming Expo in 1999. In recent years, the importance of Xuanhua grape has grown increasingly so that many agricultural products-related awards have been won. For example, Xuanhua milk grape in 2009 won the hundred top prizes for its value as a regional public brand of agricultural products in China. In 2011, Xuanhua grape again enjoyed one of the top 100 favorite brands by customers among the regional public brands of Chinese agricultural products.

Located in Guanhou village of Chunguang Town, the "Jingxi oldest vines," existing for nearly 600 years, has been watching the process of the development of Xuanhua grape culture. It is an important witness of Xuanhua history and has become the prestigious card of Xuanhua (Figure 19).

![Figure 19: The "Jingxi Oldest Vines" with Over 600 Years](image)

**III Contemporary relevance**

The system of Xuanhua Traditional Vineyard has important significance in enriching the urban landscape of Xuanhua, developing urban agriculture, adjusting the city climate and promoting ecological civilization construction of Xuanhua area, socialist new countryside construction and agricultural sustainable development.

**3.1 Enriching the Urban Landscape**

The similarities and lack of distinctive features are one of the serious problems in
China’s urbanization process. Xuanhua traditional vineyard is located in the suburbs of Xuanhua area. The landscape of funnel-framed grape is highly aesthetic and appealing, which has positive significance in adding to the variety of the urban landscape, beautifying Xuanhua area and increasing the characteristics of urban life. In addition, the Xuanhua traditional vineyard is also an integral part of urban green land, and the protection of the Traditional Vineyard is quite necessary in increasing urban green coverage.

3.2 Promoting Leisure Agriculture Development

The funnel-framed grape has unique features in historical culture, sight and taste, and is an important resource of culture and landscape. It has various essential constituents in developing tourism and leisure agriculture. With the rapid development of industries, leisure agriculture has become a necessary part of China’s urban recreation. As an integral part of courtyard economy, the traditional vineyard, combining with agri-tourism, winery and so on, offers leisure agriculture activities like grape picking, experiencing the grape cultivation techniques and wine processing, etc. that help to enrich the life of Xuanhua residents and increase their living standards. On the basis of protecting the traditional vineyard, the spreading of its culture, together with the leisure agricultural development, not only provides resource for the development of leisure agriculture, but also spurs the employment and income of the local farmers, promoting local economic development.

Guanhou village, Chunguang Town in Xuanhua District invested over 1 million yuan to pull down the 1200m long walls of grape gardens and replaced them with antique wrought iron fences, and planned to build a grape sightseeing leisure centre in order to promote the development of the local economy. Moreover, the excellent location of Xuanhua and its profound cultural connotation are also the important and complementary resources of Vineyard landscape that have tourism development potentials.
3.3 Adjusting Urban Microclimate

In summer, the temperature in the vineyards is lower than that in ordinary courtyards. Acres of Xuanhua traditional vineyard can efficiently lower the high temperature of surrounding areas in summer time, moisturize the air, reduce the urban heat island effect and purify the air quality to achieve the effect of adjusting urban microclimate. The villages and their courtyard vines frames are like an oasis (in the urban desert).

3.4 Ecological Civilization Construction

Xuanhua is located in the basin edge of northern Hebei, known as the City of Grapes. Xuanhua traditional vinery is the material achievement, spiritual fruit and system result of human’s trying to improve and optimise the relationship between man and nature by building inclusive ecological interdependence, mutual promotion and coexistent societies. The unique funnel-framed round framed cultivation of grapes is a long-standing and proven method of growing fine table grapes and has an established reputation. The brand and culture combine well to increase the product value. Xuanhua’s milk grape is grown using the cultivation funnel round holder. Promoting the protection and development of funnel round holder vinery is a way to advance the construction of ecological civilization. By doing this, it not only creates a better living environment for local people, but also demonstrates the fundamental changes of production methods that may be necessary in the future. Thus, it occupies an important place in the construction of ecological civilization and is an important part of our global heritage in crop cultivation methods and techniques.

3.5 New Socialist Countryside Construction

The protective development of traditional vineyard helps to extend to sightseeing agriculture from the cultivation of grapes and gain combined income, which makes a new impetus for rural tourism development. Initially, it achieves complex development from single cropping to tourism, increasing farmers’ income and
contributing to the city’s tourism options. On the basis of strengthening the construction of rural public culture, various forms of embodying local characteristics of mass cultural activities in rural areas are held, enriching farmer’s spiritual and cultural life. Through the participation in rural tourism, community development and the promotion of rural democratic management is increased, and promotes the construction of spiritual civilization in the countryside. Meanwhile, milk grapes and metallurgical products of Xuanhua Steel Plant are the two pillar industries in Xuanhua, known as “half city grape and half city steel”. Thus, on the basis of preserving grapes, the urbanization is developed and the ecological landscape pattern is optimized, bringing new opportunities in history for the further development of the local construction of new socialist countryside.

3.6 Sustainable Development of Agriculture

The unique type of funnel frame for table grape production can reasonably distribute and make use of water and fertilizer resources. Xuanhua is supported by science and technology. The full use of modern science and technology creates a pattern and technique of sustainable development of agriculture with local characteristics, advancing agricultural science and technology and enhancing the introduction and promotion of high quality grape varieties. In 1976, the local government set up a grape research institute, providing a platform for extending agricultural technology. The institute strengthens agro-technical training, supports new farmers, adjusts techniques, the institutional system, and helps to manage rationally the vineyard resources in an era of strong urban economic development. This helps to improve the quality and quantity of grape production, promotes integrated rural development, and increases the incomes of farmers, which makes a significant contribution to the sustainable development of agriculture in the region.

IV Threats and Challenges

The agricultural system of funnel-framed vineyard is maintained by local traditional
knowledge and is a harmonious ecological system between man, living organisms and environment. In recent years, with the local, national and international social and economic development and environmental change, the continuity and development of the system are faced with some threats and challenges. In fact, the rapid urbanization, the outflow of labor force, the impact of market, stages of socio-economic development and the limitation of technology and policy are likely to cause irreversible change to the system, leading to a reduction of biodiversity, loss of traditional agro-technical knowledge and degradation of agricultural eco-environment. These threats are within local, national and global level.

4.1 Local Level

4.1.1 Challenges Posed by Urbanization

At present, Xuanhua’s urbanization has entered a rapid developmental phase. The local government attaches more importance to real estate development and construction, seriously threatening the existence and development of this traditional agricultural area and the funnel-framed grape that is located in most farm courtyards. However, these farmers’ houses lie in the suburbs and are near to the city. These places are now classified as urban construction land according to Xuanhua construction plan, and are faced with the danger of being knocked down. Due to the rapid development of urbanization, the latest important programs include urban village renovation, enlargement of cities, construction of ring roads an inter-urban railway, and industrial park construction. There exists the contradiction between the land used for urbanization and the land for developing grapes, which causes the leveling of large areas of vineyards and the great reduction of grape production.

By the end of 2009, there were 3000 Mu in the whole area according to the official calculation, but two years later it was reduced to 1570 Mu. Now, another part of the existing vineyards is marked in the program for building ring roads, inter-urban railways and city construction. It is said that, at present, the vineyards in Dabei village
are completely included in the planning and have already been taken over. Soon the only 84.2 Mu vineyards will be opened up for development. Large areas of vineyards in Penyao village have been included in the planning of building the outer ring roads, Kunhe Green City, interurban railway and the extension of the ancient City, leaving the village only about 100 Mu of vineyards. Some vineyards in Chenjiazhuan Village are in the program of interurban railway construction. Moreover, the level of underground water in the village is becoming higher and the water is seriously polluted due to the influence of the local power station. Large areas are not favorable for growing grapes and the planting areas are greatly reduced to less than 500 Mu. If all the above factors are taken into consideration, less than 1000 Mu of vineyards are left in Xuanhua. The reduction of vineyards will cause basic resource disappearance of the grape industry, while damaging the local ecosystem.

4.1.2 The Inadequate Aggregation and Difficult Sales of Grape Industry

Although Xuanhua grape is of good quality and has a high reputation, its grape industry cluster is not big and its marketing and distribution are at a low level, which affects the further development of Xuanhua grapes. Xuanhua grapes, particularly funnel-framed grapes are produced and sold as fresh retail produce, and broadly based mainly on local sales. This retail form of production and sales, on the one hand, has no scale effect with limited impact, and on the other hand, retail production lacks extensive market research, and thus economic gains cannot be guaranteed. This often occurs in high yield years when the prices are low, while in years of high prices, yields are relatively low, which cannot guarantee a stable income. In addition, retail production lacks an effective service support system and cannot form industry cooperation. Compared to similar products from other areas, it is of poor competitiveness. Another two counties Huailai and Zhuolu, adjacent to Xuanhua, have their grapes put on the market earlier and with higher production volumes. They hold the banner of "milk grape Hsuan Hua" for sales, greatly suppressing the Xuanhua market of milk grapes, making the grape market in this area shrink, and severely
damaging farmers enthusiasm to produce quality grapes. Moreover, due to the fact that Xuanhua grapes are based on local sales, it is likely to cause market saturation, and affect economic returns.

**4.1.3 Reduction of Comparative Advantage and Loss of Labor Force**

According to our research, most of the young people surveyed are working outside of their homes or in other cities, while grape cultivation and management are left for the elderly. At the same time, it is the concern of some elders that most young people have no wish to inherit the tradition of grape cultivation, because the income of working outside is much higher than cultivating grapes at home and furthermore, the requirement of techniques and the intensity of working are much higher. Due to an inadequate understanding of the historical and cultural values of the grape cultivation, young people have no passion for grape growing.

**4.1.4 The Fresh Produce Period is Short, Difficult to Preserve**

In addition, the need to keep milk grapes fresh is underdeveloped, and at the same time, farmers’ modern sense of processing is poor. Xuanhua white milk grape is of high quality, tastes good, but the fresh period is short, it only lasts for about one month after ripening. If the grapes cannot be sold within this period, they will go rotten, causing great losses. In fact, Xuanhua milk grapes are fresh for the table not for making wine, which is problematic. Thus, the punctual sale of Xuanhua grapes is of great concern to farmers, while how to keep grapes fresh is an important research issue.

**4.2 National Level**

**4.2.1 The Lack of Attractiveness of the Development of Grape Industry**

At present, the economic benefit of cultivating grapes is low and cannot attract young people. On the one hand, it is due to the impact of China's fast economic development and the high cost of labor, that young people working out can earn good money. On
the other hand, affected by urbanization, the local grape cultivation area is shrinking, agricultural industrialization is low, the international competitiveness of agricultural products is poor, farmers' burden is heavier and factors such as market prices, which all make young people lose their confidence in future prospects in the grape industry. Besides, the low level of propaganda for local historical and cultural values of grape cultivation cannot draw enough attention for new investments.

4.2.2 The Surge in the Concept of Modern Agricultural Development

Driven by economic benefit, modern agricultural technology is constantly belittling the traditional mode of agricultural production. For example, many grape farmers choose funnel shelf instead of rack, because it's easier to manage and production is not low. In fact, rack shelf can be used to plant other kinds of grapes, not only white milk grapes, such as Lizhamate grapes and Muscat grapes. They can be sold 7, 8 yuan for half a kilo on the market, which is higher than the price of white milk grapes. The reason why many farmers continue to plant funnel-framed grapes is mainly because the season of new change to grape growing is longer, and because they really like it. Besides, if pushed to increase production, farmers will choose to use chemical fertilizers and reduce labor input, and these will affect the protection of traditional vineyards.

4.3 Global Level

The global level mainly includes the threat of global climate change to grape production. A lot of disasters such as earthquakes, typhoons, war and so on all may lead to the destruction of the traditional vineyards. In addition, in terms of grape international export, due to the complexity of the international competitive environment and the higher technical barriers, policies, safeguard clauses and so on have the potential to be a major obstacle to international trade of agricultural products, influencing the development of the grape industry. It is interesting to note however that the resilience of the grape growing system is very high as it has already recovered.
from many wars and disasters and changes in local climate over the decades.

V. Practical considerations

5.1 Ongoing efforts to promote GIAHS

(1) The conservation of traditional vineyard system is specifically mentioned in the Xuanhua Government Annual Report;

(2) A leading group for agricultural heritage conservation has been set up and is headed by Bureau of Culture, Broadcasting, News, Tourism and Sport, specializing in agricultural heritage conservation work;

(3) A research team dedicated to vineyard has been established to carry on the detailed investigation about the present situation of Xuanhua traditional vineyard cultivation, making clear priorities;

(4) A subsidy policy has been introduced to provide farmers with 1000 yuan for every new Mu of traditional vineyard grape planted;

(5) To strengthen the publicity of grape and vineyard culture, participation has taken place in the “Globally Important Agricultural Heritage System Exhibition” organized by the Globally Important Agricultural Heritage project office in China and Aohan Banner people’s government of Inner Mongolia, and other activities such as BBS communication on agricultural Heritage Systems;

(6) Improving the technology of grape growing, and cooperating with IGSNRR, CAS, and China Agricultural University to study vineyard conservation and grape production.

(7) Taking an active part in grape product awards; In 2007, the Xuanhua grape was successfully awarded "double landmark" which are national geographical indication marks and geographical indications protection products, and was rated many times as national and provincial "famous brand product".
5.2 Potentials and opportunities for sustainability and management of GIAHS

The above activities will cause a lot of potential opportunities for Xuanhua traditional vineyards, specifically including the following:

(1) Improving the Organization System and the Regulation Guarantees

Through setting up a special leading group of agricultural heritage system declaration and grape research team, it will ensure the good management of any agricultural heritage system conservation plans and the technical support implementation. It will greatly promote work smoothly; provide powerful conservation for traditional vineyards, and organizational and institutional guarantees.

(2) Raising Sufficient Funds

Through extensive publicity, and participating in the awards as well as cooperation with scientific research units, the group will raise sufficient funds for the protection of Xuanhua traditional vineyards, guarantee the project or activity from the capital, and promote the agricultural heritage system conservation work smoothly.

(3) Raising Conservation Consciousness

Through actively promoting the grape culture, providing subsidies to farmers, and participating in activities such as BBS exchange of agricultural heritage system, it can lead more people to have a deeper understanding of the history and cultural value of Xuanhua traditional vineyards, which makes the passion for grapes stronger and stimulate and enhance the conservation consciousness of the public..

(4) Developing Markets

Through extensive propaganda and communicative activities, wider markets can be opened up for the development of Xuanhua traditional vineyards. The vineyard is a kind of important culture and landscape resource, and, combined with the ancient city
of Xuanhua and its superior geographical location and deep cultural background, it is easy to extend the simple grape product sales to the development of leisure agriculture and grape-oriented industrial chains, expand the sales markets, and establish brand image at the same time. The group has the capacity to manage this multi-action task.

(5) Making Clear Protection and Direction

Through in-depth scientific research, it is clear that Xuanhua traditional vineyards have features, such as the long history of funnel-framed frame, unique landscape, agricultural multifunctionality values, etc. According to the studies on its past resilience and vitality, growth mechanisms, regional adaptability, the resource advantages and other factors, it will greatly promote the development of grape cultivation technology and sustainable management, promoting agricultural heritage system conservation.

5.3 Expected Impacts of GIAHS on Society and Ecology

GIAHS will provide an excellent international recognition and a greater space for developing the protection and development of Xuanhua city’s funnel grape growing system

(1) Social impact: First of all, the GIAHS gives an opportunity to bring forward the protection and development of the traditional vineyards and to promote new rural socialist construction, which will play an active role in protecting and promoting the funnel-framed grape culture. It will also promote the sustainable development of local agriculture, improve food safety, enlarge leisure agriculture resources, and raise farmers’ income and employment. Secondly, the ancient city of Xuanhua is located in the Xuanzhuo basin. Based on the GIAHS’s brand and Beijing’s Green Grape Corridor project, it is expected that Xuanhua can cooperate with its surrounding areas of grape production to build up the wine base, thereby creating regional characteristics of wine culture and wine culture brands, promoting regional economic growth. Thirdly, the ancient city of Xuanhua funnel-framed grapes has agriculture and
landscape characteristics. Its development is not only confined to the agricultural system, but with leisure agriculture, it will drive the agricultural economy, promote the local residents’ income, and improve environmental conditions in the city. Fourth, GIAHS will contribute to the development of the ancient city and benefit in Xuanhua’s ecology, economy and society. Fifth, the successful protection of Xuanhua’s funnel-framed grape ecosystem will encourage other communities to actively join the protection of their agricultural systems.

(2) Ecological impact: First, the active effect of a GIAHS designation will ensure the continuance of traditional vineyard culture, thereby increasing the local green covers, purifying the air, reducing dust, and improving the quality of the environment. Second, leisure agriculture based on traditional vineyards, will contribute to the improvement of the rural environment and city’s ecological construction. Third, traditional vineyards reduce the use of chemical fertilizer and pesticide, which is conducive to the improvement of the regional ecological environment.

5.4 Motivation of the Local Community, the Local/National Authorities and Other Relevant Stakeholders

The main beneficiaries of the Xuanhua’s traditional vineyards protection include: local communities, local and national governments, food enterprises, and tourism. Their protection motivations and benefits are as follows:

(1) Local Communities: There are three motivations. First, local residents hope to raise the sale price and their income by protecting the traditional vineyards. Second, they hope their vineyards can be better protected via the power of GIAHS. Third, they hope to enhance the sense of place and pride in local cultural identity.

(2) Xuanhua Authority: There are four motivations. First, the development and construction of the local real estate industry threatens the existence and development of the vineyards, while the local government hopes to prevent this traditional agricultural model from being erased by contemporary urbanization
and preserved for future generations. Second, since many local residents lack conservation consciousness of ancient vineyards, the local government hopes to strengthen the publicity of the traditional vineyards and increase the awareness of grape protection, so as to achieve the goal of protecting the vineyards with public support. Third, the local government hopes to create high-end brand of grape via GIAHS, build up the organic industrial chain symbolized by the traditional vineyard system, and improve the economic benefit of Xuanhua’s traditional funnel support vineyard, while increasing the income of the residents. Fourth, the local government hopes to develop the traditional vineyard tourism, including sightseeing, leisure, vacationing, and shopping. Not only can they produce high-quality table grapes, but can also stimulate other value-added processes and related businesses. The GIAHS will promote the city culture and economic strength.

(3) **National Government**: Xuanhua’s funnel support vineyard has a long history, is a state government wants to support the vineyard culture with three motivations. First, it has the valuable historical agricultural heritage. Second, it plays the role of a model to stimulate the protection of other agricultural ecological system, especially within cities. Third, the positive influence of GIAHS can enhance regional cooperation, develop the traditional vineyards of the economic and ecological benefits, and promote agricultural sustainable development.

(4) **Tourists**: To appreciate the traditional vineyards, tourists hope to enjoy this unique and pleasant landscape, try the delicious and safe grapes, and experience the grape growing atmosphere.

(5) **The Relevant Enterprises**: Their motivation is to raise the value and brand of their products, improve the economic benefits and develop their businesses in the long run.
VI DYNAMIC CONSERVATION PLAN FOR GIAHS SELECTED SITE -MASTER PLAN

I Overall description of the master plan

The overall aim of the project is to conserve the Xuanhua traditional vineyard system. Through the formulation and implementation of the project, the ecosystem, its related rural culture and its rural landscape will be preserved for future generations of farmers, locals and the citizens of China and the whole world.

1.1 The base line of the master plan (See more on 5.1)

(1) The traditional vineyard system conservation was listed in the annual report of Xuanhua District.

(2) The agricultural heritage conservation leading group was established in Xuanhua District.

(3) The research group of traditional vineyard system conservation and development was established and the cooperation with CAS and other agricultural universities was built.

(4) The popularization and awareness raising of GIAHS conservation and development was promoted and lots of work have been done.

(5) Take part in lots of activities for traditional vineyard system and grape product production.

1.2 Stages of the master plan

- 2013-2014: short-term
- 2018-2023: long-term

1.3 Agricultural Heritage Site Scope and Function Division
(1) Scope of Agricultural Heritage Site

Xuanhua traditional vineyard agricultural heritage scope has all the vineyards in Xuanhua region, including all the vineyards in Chunguang County; Xuanhua region also includes vineyards of Xuanhua Vineyards Institution, a total area over 1 000 Mu.

(2) Core Protected Area

Xuanhua traditional vineyards protected area is Guanhou village, Penyao village and Dabei village, with an area of 739.64 Mu (0.49km²). Grape planting of the three villages is shown in Table 1:

Table 1 Table of investigation of Xuanhua vineyard planting demonstration region (2012)

<table>
<thead>
<tr>
<th>Name of the village</th>
<th>Total Population (person)</th>
<th>Total Household (household)</th>
<th>Grape planting households (household)</th>
<th>Cultivated area (mu)</th>
<th>Grape planting area (mu)</th>
<th>Garden frame (frame)</th>
<th>Row frame (row)</th>
<th>Annual yield (kg)</th>
<th>Per capita income (yuan)</th>
<th>Grape income to total income</th>
<th>Grape Income to agriculture income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanhou Village</td>
<td>1128</td>
<td>943</td>
<td>273</td>
<td>412</td>
<td>305.64</td>
<td>736</td>
<td>186</td>
<td>106.01</td>
<td>7320</td>
<td>13%</td>
<td>45%</td>
</tr>
<tr>
<td>Penyao village</td>
<td>1296</td>
<td>1256</td>
<td>291</td>
<td>1020</td>
<td>349.8</td>
<td>985</td>
<td>94</td>
<td>104.94</td>
<td>7500</td>
<td>16%</td>
<td>52%</td>
</tr>
<tr>
<td>Dabei village</td>
<td>2256</td>
<td>870</td>
<td>146</td>
<td>507</td>
<td>84.2</td>
<td>287</td>
<td>21</td>
<td>30.95</td>
<td>6076</td>
<td>9%</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>4680</td>
<td>3069</td>
<td>710</td>
<td>1939</td>
<td>739.64</td>
<td>2008</td>
<td>301</td>
<td>241.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

2 Conservation activities

2.1 Agricultural EcologyConservation

Activities of Conservation and Action Plans

- Making a broad investigation of Xuanhua traditional vineyard agricultural biodiversities, farmland ecological environments and resources; Establish a database, and analyzing and evaluating the related data; (short-term, departments responsible: the agricultural sectors and the grape research
Having the ecological protection publicity materials of Xuanhua traditional vineyard, and popularizing through various forms the importance of traditional vineyard ecological protection, such as websites, activities, and other forms of presentations, publicizing especially to farmers within the protection zone to improve their protection consciousness; (short-term, mid-term and long-term, departments responsible: the agricultural sectors and the departments of publicity)

Protecting vineyards within the protection zone using hangtags, making clear to the people responsible their specific responsibilities, and corresponding punishment measures; (short-term, the departments responsible: the cultural sectors, the agricultural sectors and the grape research institutions)

Setting up a special department to supervise and monitor the traditional vineyard soil, water, and related conditions, to control the use of fertilizer and pesticide; Prohibit destructive operation and construction activities in the surroundings of vineyard protection zone; (short-term, departments responsible: the agricultural sectors and the departments of environmental protection)

Harnessing the rural environment within the protection zone; central-collecting and central-processing of household and farm garbage, lessening pollution and bad visual effects caused by waste piling up (short-term, departments responsible: the agricultural sectors and the departments of environmental protection);

Restoring gradually traditional vineyard zones, making them important parts of the ‘greening’ of Xuanhua city; (mid-term, departments responsible: the agricultural sectors and the departments of landscape)

Renovating ecological environments in the three villages like Chunguang County in Xuanhua region; reducing foul smells through combining
animal manure with human excreta; treating harmlessly wastes generated in the protection zone and recycling them. Administering products and renovating the environment in Penyao village in accordance with the requirements of organic agriculture; Administering products and renovating the environment in Guanhou and Dabei villages in accordance with the pollution-free agricultural standards; (long-term, departments responsible: the agricultural sectors, the departments of environmental protection and the grape research institutions)

- Centralizing the treatment of home sewage and production sewage within the protection zone to reduce upstream water pollution and the destruction of farmland ecological environments; Establishing sewage treatment plants in the city or unifying the treatment of the sewage input into the sewage treatment sectors. Setting up fixed-point home garbage storage facilities, and centralizing the processing of rubbish; realizing the "classified collection, bagged garbage, confined transportation, and harmless treatment". (long-term, departments responsible: the departments of environmental protection and the agricultural sectors)

2.2 Agricultural Culture Conservation

Activities of Conservation and Action Plans

- Making across-the-board investigations related to Xuanhua traditional vineyard culture, including material culture and non-material culture in general, such as traditional folk art, folk performance, art, folk customs, traditional proverbs, folk songs, poems, protecting and celebrating various kinds of ancient buildings, and doing classifications and evaluations accordingly; Excavating the traditional vineyard culture connotations, tracing the different forms of traditional vineyard cultural heritage; (short-term, departments responsible: the cultural sectors)

- Supervising by special designated departments, the protection of rural
culture; Training related cultural and artistic talents in various forms, such as schools, training courses, online courses and so on; (short-term, departments responsible: the cultural sectors)

- Setting up with modern information technology like visualization, the traditional vineyard museums and experience parks based on grape research institutions, and combining the protection and exhibition of traditional cultural elements in the vineyards; (mid-term, departments responsible: the cultural sectors, the grape research institutions)

- Repairing ancient buildings with cultural value in Guanhou village, making them part of the Village Museum, and integrating them with the traditional vineyard culture protection; (mid-term, departments responsible: the cultural sectors and the departments of construction)

- Restoring the Grape Culture Festival, with its focus on the exhibitions and innovations of grape culture as such as grape feasts in the village; (mid-term, departments responsible: the cultural sectors)

- Editing and publishing a book series associated with traditional vineyards and making related DVDs; Displaying vineyard culture and developing products with information technology; (mid-term, departments responsible: the cultural sectors)

- Developing Xuanhua traditional vineyard culture products and cultural innovations, creating a well-known brand of the Grape Culture Festival in Xuanhua, providing large-scale cultural performances, and making cultural innovations that will drive regional development; (long-term, departments responsible: the cultural sectors)

- Producing attractive cultural products with the connotation of traditional vineyards, such as rural outdoor performances, movies and TV programs and so on; Promoting regional cultural innovations, economic development and
agricultural heritage through cultural and creative industries (long-term, departments responsible: the cultural sectors and the departments of radio and television)

2.3 Rural Landscape Conservation

Activities of Conservation and Action Plans

- Making a detailed survey of land utilization in Xuanhua region, as well as the utilization of buildings with traditional characteristics; Making a large-scale landscape pattern map; establishing the corresponding architecture, landscape databases for classifications and evaluations of special features; (short-term, departments responsible: the departments of land management and grape research institutions)

- Setting up dedicated institutions to monitor and supervise the landscape changes in Xuanhua traditional vineyard protection zone; Prohibiting the disharmonious landscapes, especially modern high-rise real estate, and preventing them from building illegal structures; (short-term, departments responsible: the grape research institutions and the departments of construction)

- Training farmers within the protection zone, making them understand clearly the benefits that Xuanhua traditional vineyard landscape values may bring to them; encourage affection and pride towards their hometown; (short-term, departments responsible: the agricultural sectors and the cultural sectors)

- Giving good guidance to the commercial activities within Xuanhua traditional vineyards, to avoid landscape destruction caused by pernicious competition; Unifying the management of commercial activities, and reducing the overall impression of the damages brought about by careless business irregularities in the Xuanhua traditional vineyards; (mid-term, departments responsible: the departments of economic management and the departments of construction)
• Repairing buildings according to the historical architectural styles of various dynasties; houses along both sides of the main road can be lead to the development of tourism reception facilities, and repair parts of them according to architectural forms of Tang, Ming and Qing Dynasties; (long-term, departments responsible: the departments of planning and departments of construction)

• Displaying with modern information technology, the characteristics of the traditional vineyard landscape through visual means to enhance the degree of landscape attractiveness. In addition, combining with the cultural and creative industries, and include the landscape characteristics in the creative activities and creative products to enhance the cognition towards Xuanhua traditional vineyards and strengthen the consciousness of landscape protection; (long-term, departments responsible: the departments of science and technology, the cultural sectors, and the agricultural sectors)

• Publicizing landmark buildings in Xuanhua City, the main tourist areas, reception facilities taking grapes as its theme, and creating the whole Xuanhua City as "wine city" (long-term, departments responsible: the cultural sectors, the departments of construction, and the departments of planning).

3 Development Activities

3.1 Ecological Product Development

Activities of Development and Action Plans

• Making across-the-board investigations into Xuanhua traditional vineyards, to obtain relevant data and information of ecological products, and establishing a database for the classification and evaluation of properties and potential products; (short-term, departments responsible: the grape research institutions)

• Formulating ecological product development standards of Xuanhua
traditional vineyards, establishing specialized agencies to monitor the ecological product development activities to ensure the quality of the products and the use of Agricultural Heritage System from the related products; (short-term, departments responsible: the agricultural sectors);

- Selecting and promoting organic agriculture, pollution-free agriculture and green agricultural production bases in Penyao village, Guanhou village and Dabei village, and organizing production through big farmers, agricultural cooperatives and the company + farmers modes respectively; (short-medium term, departments responsible: the agricultural sectors and the departments of environmental protection)

- Selecting demonstration households in the protection zone, focusing on monitoring their grape production and its products; Providing supports to form the driving mechanism of demonstration households to other farmers in order to protect traditional vineyards; (short-term, departments responsible: the agricultural sectors and the cultural sectors)

- Producing ecological grape production, as well as authenticating organic agriculture, pollution-free agriculture and green products in Penyao village, Guanhou village and Dabei village, also authenticating agricultural heritage grape products of 50% demonstration households; (mid-term, departments responsible: the departments of environmental protection, and the agricultural sectors)

- Registering trademarks of Xuanhua traditional vineyards and products; (long-term, departments responsible: the agricultural sectors)

- Developing Xuanhua traditional vineyard ecological products through a variety of channels, increasing continuously the market popularization driven by the brand effect; Promoting ecological product prices of Xuanhua traditional vineyards to meet the economic needs of grape planting farmers. In the tourism development sector, introduce innovative and creative products combined with
the cultural and creative handicrafts, to promote the Xuanhua traditional vineyards and market influence. (long-term, departments responsible: the agricultural sectors, the cultural sectors, and the departments of tourism)

3.2 Sustainable Tourism Development

Activities of Development and Action Plans

- Making a detailed investigation into tourism resources, facilities, housing construction in Xuanhua traditional vineyards, and establishing a database for classifications and evaluations; (short-term, departments responsible: the departments of tourism)

- Making an evaluation and orientation of the tourism market in Xuanhua traditional vineyards, making clear the primary market, the secondary market and the market for future opportunities; Segmenting the targeted market and project marketing based in the Beijing-Tianjin-Hebei market corridor; (short-term, departments responsible: the departments of tourism)

- Bringing the traditional vineyards into city tourist routes, putting them into the Xuanhua tourist publicity materials, and increasing introductions about the vineyard tours. Specific lines such as: ① City sightseeing line: Ancient City Building (South Gate Building – Drum Building – Bell Building – Xuanhua Museum – The Catholic Church) – The Ancient City Wall – Xuanhua Traditional Vineyards (1-2 days tour); ② Heritage Experience Line: Liao Dynasty Tombs In Xuanhua Traditional Vineyards - Xuanhua Ancient City Wall Ruins - MA House (1-2 days tour); ③ Leisure Experiencing Line: Xuanhua Traditional Vineyards - Wohushan Golf Course (staying for 2-3 days); (short-term, departments responsible: the departments of tourism)

- Focusing on the Xuanhua agricultural heritage tourism theme, dividing in space according to its functions "two cores and one region", and forming a pattern "from points to the region, extending in a spokewise manner". First of all,
from the point of view of locations and infrastructures, tourism development conditions in Guanhou village is the best, with some farmers strongly supporting tourism development. Therefore it would be selected as one of the cores; Grapes in Penyao village are of the best quality, for they are now still irrigated by Liuchuan River, and farmers also have a strong desire to develop tourism, hence it can be chosen as the other core. With the north wall of the ancient city and both sides of Beijing-Tibet super highway transportation is convenient and the vineyards accessible, they can be formed as vineyard tourism region along the line. Based on the two cores, they will influence other vineyards in Xuanhua, eventually enlarging the northern Xuanhua vineyard tourist region; (mid-term, departments responsible: the departments of tourism)

- Setting up Xuanhua Traditional Vineyard Museum and the experience center depending on the Grape Research Institution and Guanhou village; By means of information technology and visualization technology, renovating the conference room on the second floor of Xuanhua Grape Research Institution into traditional vineyard museum exhibition and experience center. Renovating in a totally traditional way 10 acres of traditional vineyards delimited by the Grape Research Institution, fully using materials prior to the industrialization era, and together with environmental remediation, to form the complete traditional vineyard display region. Training 20 households to become the field farmers of the traditional vineyard culture exhibition region and tourism receptionists; (mid-term, departments responsible: the departments of tourism)

- Applying for agricultural leisure demonstration model; (mid-term, departments responsible: the departments of agriculture)

- Setting up visitor’s center in Guanhou village based on farmers’ residences, refurnishing related buildings and roads. Forming Xuanhua traditional vineyard leisure farm, traditional vineyard culture experience center and traditional vineyard education experience zone; (mid-term, departments
Developing a tourism interpretation system with unique characteristics of Xuanhua, combining the sound commentary with the interpretation. Giving in the official interpretation prominent local features, using more local interpreters, especially the grape farmers. Highlight the interpretation content with the important value of the traditional vineyards, and with emphasis on combining the tourists existing knowledge to enhance their understanding and support for protection. Combining the interpretation with tourism training, establishing special traditional vineyard tourists training materials, such as books, brochures, audio-visual materials, and official training, standardizing tourists behavior. At the same time, it can also be developed into tourism products; (long-term, departments responsible: the departments of tourism and the departments of publicity)

Designing Dragon Resort, west of The Grape Research Institution and the ecological restaurant, east of The Grape Research Institution, in accordance with the grape theme reception, making it become an integral part of the traditional vineyard tour; (long-term, departments responsible: the departments of construction and the departments of tourism)

Providing a variety of conveniences for tourists by making full use of information technology in the protection zone, such as constructing a visual terminal, APP mobile phone development, making information authentication for each grape products to enhance intimacy with the tourists, hence form valued products etc.(long-term, departments responsible: the departments of construction and the departments of tourism)

Making a survey of various stakeholders in Xuanhua traditional vineyards, evaluating the rationality of the decision-making model, investigate farmers' willingness to participate in decision-making as well as the participation purpose; Evaluating their participation in decision-making ability according to
their level of knowledge, participation experience and so on; (short-term, departments responsible: the cultural sectors, the departments of agriculture and the Chunguan Township Government)

- Taking Xuanhua region cultural departments and Xuanhua traditional vineyard communities (Guanhou village, Penyao village and Dabei village) as the main body, other relevant departments as the supplements, constructing development decisions and an information exchange platform of Xuanhua traditional vineyard protection, making clear the scope of their responsibilities respectively, attaching importance in the community decision-making and to their participation, with a certain rights of freedom, to form a good basis for community participation in decision-making and guiding the development of the vineyard as a protected site; (short-term, departments responsible: the cultural sectors and Chunguang Township Government)

- Selecting demonstration households, and giving them basic training in the participation and decision-making abilities, including all ages and genders; Improving grape farmers’ participation awareness and the degrees of participation through experiencing activities and relevant case learning activities to strengthen the effectiveness of their participation; (short-term, departments responsible: the cultural sectors, the agricultural sectors and Chunguang Township Government)

- Designing some activities to strengthen farmers’ participation abilities, such as cultural festival activities, catering receptions, grape theme culture designs, and agricultural competitions to entrench in the farmers the traditional vineyard feelings. In addition, through creativity and organizational activities, improving the decision-making ability of traditional vineyard community culture, forming activity guidance and decision-making direction with farmers as the main body, grape as the theme; (mid-term, departments responsible: the cultural sectors, the agricultural sectors and Chunguang Township Government)

- Establishing sound relevant rules and regulations of Xuanhua traditional
vineyard community protection and community participation so as to ensure the seriousness and continuity in community participation and implementation. In the relevant rules and regulations, clearly stipulate the goals and significance of the traditional vineyard protection from the community participation, direction and means of implementation, the organization of community participation implementation, the responsibility, supervision, rewards and punishment measures of relevant institutions and personnel authorities; (long-term, departments responsible: the cultural sectors, and Chunguang Township Government)

- Assessing regularly the ability of the traditional vineyard community participation, solving problems arising from participation, and improving the farmers’ weak position in participation. Arranging specific ability-enhancing projects according to community participation, such as further training, activity design, cultural awareness promotion and so on, to enhance farmers' consciousness and participation ability.(long-term, departments responsible: the cultural sectors, and Chunguang Township Government)

4 Carrying Capacity Building Activities

4.1 Cultural Consciousness Improvement

Activities and Action Plan

- Grape planting farmers training: Training the traditional vineyard farmers of the preserved district to instill the important values and significance of the agricultural heritage; organizing the learning for the peasant household as the main unit of production and protection; raising the awareness of protection of the farmers; improving farmers’ pride in the traditional vineyard; particularly training youth and women. (short-term, the departments responsible: the cultural department and township government.)

- Tradition vineyard farmers association: Setting up traditional vineyard farmers
association in the protected area; the president of the association and members are elected by the farmers themselves; driving the whole campaign for the farmers in the protected area of grape cultivation and production of related products. The Association needs the approval by the culture department in Xuanhua area to get the operating money and decision-making power in the protection of traditional vineyards. The Association is also responsible for the related propaganda, organization, assessment. (short-term, the department responsible: the culture department.)

- Cultural activities performances: Under the organization of Vineyard Association, traditional vineyard farmers regularly hold cultural activities and performances, sometimes in combination with other tourism festival activities. Attach great importance to the participation of women and adolescents; encourage various kinds of cultural elements in the activities, making it relate to people’s lives. (mid-term, the department responsible: the cultural department.)

- Cultural products: encouraging the vineyard planting farmers to set up grape culture archives with texts, photos, videos to record their daily life. The archives on the related information can be regularly collected and published by the cultural department. On this basis, the cultural symbols can be inducted into cultural products, such as calendars, festival script gallery, exhibitions, performances, etc.. The cultural products can at the same time be combined with tourism activities to develop creative products. Stimulating vineyard protection awareness and the cultural consciousness. (long-term, the departments responsible: culture department and culture department.)

4.2 Decision-making and Participation Ability Building

Development Activities and Action Plans

- Examining the various related stakeholders of Xuanhua traditional grape garden, evaluating the rationality of their decision model, investigating the peasant
households’ will to participate and their purpose, evaluate their decision-making and participation ability based on their knowledge level, participation experience, etc. (short-term, the departments responsible: culture department, agricultural department and Chunguang Township government.)

- Building the steer committee. The culture department of Xuanhua district and Xuanhua traditional vineyards community (The Guanhou Village, The Penyao village and the Dabei village) as the main steering body and other relevant departments for supplementary support, build the decision-making and information exchange platform for Xuanhua’s vineyard protection and development. Being clear about their respective responsibilities, attaching great importance to their importance in decision-making and participation. Offering certain liberties to form a good foundation for community’s decision-making participation. (short-term, the departments responsible: culture department and Chunguang Township government.)

- Choosing a model household. Provide them with basic training about their ability to participate in decision-making. By participation in activities and learning relevant cases, etc., enhancing grape planting farmers’ participation awareness, the level of their involvement and the participation effects. (short-term, the departments responsible: culture department, the agricultural sector, and the Chunguang Township government.)

- Designing activities to increase farmers’ participation ability, such as involvement in cultural and festive activities, restaurant reception activities, grape-based theme designing activities, farming games and so on to increase farmers’ affection for traditional vineyard. Besides, through creativity and organization, the culture decision-making ability of the traditional vineyard community can also be improved, formed with farmers as the main body, the grapes as the theme for the activities guides and decision-making directions. (mid-term, the main responsible departments are culture department and Chenguang township government.)
• Establishing and improving the relevant community participation rules and regulations to propagandize Xuanhua’s traditional vineyard protection; ensuring the seriousness and continuity of the community participation and implementation. In the rules and regulations, the followings should be clearly defined: the purpose and significance of the community participation in the protection of traditional vineyards, the route and the approach of the implementation, the organizers of the community participation, the authority, responsibility, supervision, rewards and punishments of the relevant organizations and personnel. (long-term, the departments responsible: culture department and Chunguang Township government.)

• Evaluating periodically the participation ability of traditional vineyards, finding out the problems involved and raising the farmers’ weak position in the participation process. According to the problems, conducting some specific projects to help promote community participation consciousness and ability, such as advanced training, activities design, cultural self-consciousness promotion and so on. (long-term, the departments responsible: culture department and Chunguang Township government.)

4.3 Operation and Management Ability Improvement

Activities and Action Plans

• Taking the cultural department of Xuanhua District and the communities where the traditional vineyards are located as the main responsible body and the relevant departments as supplementary, establish an information exchange platform for the protection and development, the operation and management of Xuanhua traditional vineyards. Make sure respective responsibilities of different departments. Attach importance to community independent operations and management. Provide departments with more freedom to lay a good foundation for community independent operation and management. (short-term, the departments responsible: culture department and Chunguang Township government.)
• Formulating comparatively complete management regulations for traditional vineyards. Provide training to help farmers in aspects of production technology, operation and management models and marketing activities. Building a communication channel for farmers’ operation and management. Typically demonstrate the model farmers’ operation and management, and production activities. Establishing an archival information system for the farmers’ production, operation and management knowledge. Adjusting and improving it on a regular basis so that the economic income of the traditional vineyard will continue to grow.

• Providing the communities where the traditional vineyards are located (mainly Guanhou village, Dabei village and Penyao village) with training in the aspects of traditional vineyards agricultural production, operation and management models, management effects so that farmers’ participation ability for operation and management can be improved. Through the training, enabling farmers to understand the great importance of participation in the independent production, operation and management of the vineyards so as to increase farmers’ self-confidence and independent ability and to strengthen the self-sustaining and development ability of those communities. (short-term, the departments responsible: culture department and Chunguang Township government.)

• The human sources construction of Xuanhua traditional vineyards involves: technical personnel training, management talents cultivation, farmers’ skills cultivation and measures for perfecting the management of human resources. Paying special attention to the involvement of the young in particular, involving the cultivation of young technical personnel, young management talents and the farmers’ skills. (mid-term, the departments responsible: culture department and Chunguang Township government.)

• Coordinating the supervision of the community operation and management of the government.)
traditional vineyard and setting up the specific supervision institutions. Analyzing the benefits of the production and operation projects on a regular basis and timely finding out the problems and trying to solve them. (long-term, the departments responsible: economic department and Chunguang Township government.)

- At a later development stage, expanding the production and operation dimensions with the help of foreign investment, enhancing the influence of the market so as to increase the production and processing ability of the X vineyard community. However foreign investment should not exceed a certain share, and at the same time, must be kept in check as the dominant position in the community are the local farmers and their independent production. (long-term, the departments responsible: economic department and Chunguang Township government.)

5. Safeguard Measures

5.1 Institutional Guarantee

- Laws and Regulation Construction

Xuanhua district should clarify the legal status of the city plans and introduce specific “Agricultural Heritage Protection Ordinance” and the related management measures. The regulations and measures should make detailed requirements and regulations for the protection of traditional vineyards, interpret and explain the detailed rules for the protection. At the same time, measures should be clearly stipulated to punish the destruction of cultural heritage. Fundamentally ensure the protection of Xuanhua traditional vineyards by using legal means. This process will be significantly enhanced by the designation of a GIAHS.

- Formulate Preferential Policies

In order to promote the protection of the traditional vineyards, Xuanhua District government should provide strong support for traditional vineyard protection in preferential policies, such as providing the special protection money, giving policy
support for the agricultural heritage tourism and ecological products and offering the policy and economic support to the residents in the protected area.

- **Implement the Supervision and Management**

Xuanhua district should have a clear reward system and rewards and punishment measures for the protection of the traditional vineyards. Strictly managing the use of the logo of agricultural heritage and at the same time, supervising and inspecting the implementation of the plan on a regular basis and forming a regular reporting system.

5.2 Organizational Guarantee

- **District and Township Organization Guarantee**

Xuanhua district should establish a protection steering committee and leading group for the protection of the cultural heritage in the traditional vineyards. The leaders in the district are mainly responsible the guarantee for the smooth implementation of the protection of the cultural heritage in traditional vineyards and they are also responsible for the management and implementation of the projects at international or national levels. The committee consists of executive offices which are responsible for the implementation of the work of the committee. The committee is located at the Agricultural Committee of the District, which is convenient for it to put the work into effect. The township government should set up institutions coordinated by specially-assigned personnel.

- **The Construction of the Village-level Organization**

Village Committees, set up in Guanhou village, Penyao village, to be self-governed by villagers and participated in by village members and village enterprises. This can increase villagers’ consciousness of protection and the enthusiasm for participation in the protection, realize community co-management and keep the smooth running of the specific implementation of the protection projects.

5.3 Technical Support
● **Strengthen the Related Scientific Research**

Some related scientific research has been carried out, such as the distribution of the vineyards, the exploration of the mode of vineyard tourism development, the ecological mechanism research of the traditional vineyards, etc.. However, the research is still at the beginning stage. In order to realize the dynamic protection of the agricultural heritage, the governments of the districts which enjoy heritage should have a good cooperation with the scientific research institutes at home and abroad and continuously strengthen the scientific research on technical aspects of vineyards, the indicator system for the supervision and management, and the crucial technology research and development. On the basis of this, the expert advisory body for protection and research should also be established.

● **Compile and Improve the Technical Specifications for the Traditional Vineyards System**

In order to help farmers to learn more advanced techniques in traditional production, an organic agricultural production technology procedures which focus on cultivation techniques, fertilization technology, plant diseases, insect pests prevention and control technology, should be compiled and be transferred into a technological integration and demonstration. At present, Xuanhua Grapes Institute has contributed a lot to grapes planting technology popularization. However, the relevant publications with cultural heritage protection as a core need further development and improvement.

### 5.4 Fund Guarantee

Xuanhua district and township governments should broaden financial resources, establish multi-channel fund raising measures and set up agricultural heritage system conservation fund which can be used as the specific fund in the protection project. There are the following main channels of financing: international aid; the state supports, such as the relevant policies, subsidies, projects, etc.; local support, such as the relevant policies, subsidies, project, etc.; social funds, including donations,
corporate funding and denying benefits, etc; and market exploitation which can also be taken into consideration to get enough money to prolong the protection of the grape food chain.

With the designation of GIAHS status, this endangered area and its unique system of growing table grapes will not only be saved, but developed into a robust and vibrant local economy within the city of Xuanhua. As a world example of a GIAHS, it will demonstrate how traditional systems that employ sound ecological principles can exist and thrive within the confines of a modern city.
SUGGESTED ANNEXE 1  Maps

The location of Xuanhua District
The distribution map of vineyards in Xuanhua
SUGGESTED ANNEXE 2: Biodiversity of Xuanhua Traditional Vineyards

(1) Grape

There are more than 40 varieties including White Grape, Rizamat, Thompson Seedless, Muscat Hamburg, Zhana, Kyoho, Queen of Vineyard, Green Banana, Seedless Purple, Phoenix 4/12, Red Grape, Longaniza, Tiger Eye, Plums etc, in which White Grape stands for the specialties of Xuanhua occupying around 80% of the total planting area.

(2) Other Biodiversity

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<th>Vegetable &amp; Fruit</th>
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### Protecting Wild Animals

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SUGGESTED ANNEXE 3. The History of Xuanhua traditional vineyard system

There has been a long history of grape planting in China, but modern grape varieties are introduced from Central Asia, not China. For the origin of grape planting, there are two kinds of sayings in Chinese history. One is from the era of the Shang and the Zhou dynasties, the other is West Han dynasty. The saying of Shang and Zhou can be proved by the historical documentary, such as Book of Songs and Rites of the Zhou. In the Book of Songs, there is a poem mentioning Ge Lei, which refers to the wide grape. In the Rites of the Zhou, the vineyards and grapes are also mentioned. As the saying goes, the Chinese ancient people in Zhou dynasty, over 3,000 years before, has already planted grape in the imperial garden, saved and preserved grape. Grape was regarded as a kind of treasure fruit only reserved for the royal family.

The second saying can be proved by the History of the Han Dynasty and The Records of the Historian. The introduction of Eurasian grape is traced back to the Emperor Wu of Han Dynasty, about 130 BC. The historian, Bangu, recorded the grape and vine in his work of History of the Han Dynasty. The Han historian and litterateur, Si maqian, recorded the first person, who introduced the grape from Central Asia to China, is Zhangqian, the envoy of Han dynasty. The agronomist in North Wei Dynasty, Jia sixie, also record this historical event in his book of Qi Ming Yao Shu. He also wrote that grape were not very popular among the civilians, but only planted in imperial cities and reserved for royal families and high ranking officials.

Grape planting after the development of nearly a thousand years to the Tang Dynasty, has been widely planted in the folk and the planting technology has been matured. There were many documentaries recording the graph planting and vine making in Tang dynasty. Many literatures and poems in Tang Dynasty referred to the grape and wine as well. Jia Sixie completely introduced grape cultivation, pruning, keeping out of cold, picking, storage, processing methods in his book.
The Heshuo area in Heibeidao, the Dai zhou in Hedongdao, and Pingcheng (Datong) were the main area of grape planting in Tang dynasty. Xuanhua used to be called Xiongwujun and Wuzhou, and were governed by Hebeidao and Hedongdao in Tang dynasty. The geography and climate in Xuanhua are very suitable for planting and cultivation of grape. Originally, the grape in Xuanhua was planted in temples. According to the historic record, Liupeng is the first man introducing and planting grape in Xuanhua. Liupeng was the military official in Tang dynasty, and he used to cultivate farmland extensively in Xuanhua. It is noting important to prove whether Liupeng is the first man to introduce grape to Xuanhua or not in history. Because at that time, it is no doubt that Xuanhua has been very developed and flourishing. The archaeologists have discovered hundreds of luxurious tombs of Tang dynasty, inside and outside of Xuanhua city. The economic prosperity promoted the grape planting, so that it was not difficult to find grape planting in the courtyard of government, wealth people and temples. For the courtyard planting, convenient funnel shaped grape planting method was formed gradually in this period, and it has been more than 1300 years.

The archaeological findings further confirmed Xuanhua’s grape planting in Liao dynasty. In 1993, there was an archaeological excavation in Bali village of Xuanhua. A dozen of the Liao tombs were discovered, one of which is Zhang wenzao’s. Grape was found in it, dry but well-preserved, which has been the only ancient grape discovered in China so far. The wine kept in bottles was also discovered and identified in the same tomb and on the tomb’s murals. The female owner of the tomb could be seen on the murals, listening to the folk songs, having fruit and snack, and tasting wine which was made of grape. This archaeological discovery is great in the history of Xuanhua’s grape cultivation, and history of chinese grape cultivation and wine brewing, which confirms the grape planting and wine brewing in Liao dynasty was widely popular in folk.

In Liao and Song dynasties, there were records about the methods of grape planting.
For example, the famous doctor, Tang shenwei, in Song dynasty and his work *Zheng Lei Ben Cao*, and historic book *Da Jin Guo Zhi*. The other technology of grape planting, such as cottage, transplant, also could be found in historic books.

There is one thing worthy of attention in excavation of Liao tomb. The specific time buried Zhang Wenzao was on April 15th, 1093 in the lunar calendar, and according to the solar calendar it should be in the middle of May, which could be found from the memorial tablet of the tomb. This is not the seasons for local grape ripened, because local grape gets matured around the Mid-Autumn festival, the lunar August 15th. So that we can infer that burial grape in Zhang wenzao tomb had to be picked up in the previous year, which proves that as early as one thousand years ago in the Liao dynasty, the farmers growing grapes had mastered the storage technology of grape.

For the storage and preservation of the grapes, there was a new method in Liao and Song dynasties. The great litterateur, Sushi, in Bei Song, recorded this kind of method in his book *Ge Wu CU Tan*.

In Yuan dynasty, the grape planting in Xuanhua was quite common, and was also in a considerable scale. According to the *History of Yuan. Yelu Chucai*, there were thousands of farmers who planted grapes. In today’s Xuanhua city, there is a vineyard in Guanhou Street, where the grape tree remains alive and has more than 700 years history.

In Ming dynasty, Xuanhua became the strategic post, Xuanfuzhen, near the Great Wall. It was heavily guarded. So grape planting were mainly in the north of city, on the banks of Liuchuan river.

In Qing dynasty, there were less military guarded in Xuanhua, so more lands were used to plant grape in the north and west of the city. The grape planting in Xuanhua reached an unprecedented scale.

The records of planting grape could be found in all preserved ancient local records, such as “*Xuanfu Zhen Zhi*”, “*Xuanhua Fu ZHi*”, “*Xuanhua Xian Zhi*”, and “*Xuanhua
The Xuanhua Xian Xin Zhi published in 1922, mentions that there are three kinds of grapes in Xuanhua, and their characteristics, including White grape, Dark red grape and red grape.

The Xuanhua Xian Xin Zhi also mentioned Xuanhua grape was well known in China and the sales were extremely good at that time.

It is said that some historical figures once tried the local grape in Xuanhua, such as the Empress Xiao in Liao dynasty, the peasant uprising leader Li Zecheng in Ming dynasty and the Empress dowager Cixi. In Qing dynasty, Xuanhua white grape was assigned as the ‘Royal Tribute’ by Qing court. In 1909, the Xuanhua white grape also won awards “International Products Expo” in Panama. As the leading grape in the industry, the Xuanhua’s white grape enjoys high reputation both at home and abroad.

In 1920s and 1930s, the grape planting in Xuanhua reached the peak. According to the book Xuanhua Basin published in 1938, Xuanhua grape was very popular in Beijing at that time, and most of grape the Beijing residents had were from Xuanhua. It was all known that Xuanhua grape had high economic value. The grape planting area in Xuanhua was more than 260 acres, with more than 6,150 grape trees, the annual output 680,000 kg. Besides Beijing, Xuanhua grape was also sold to other cities and provinces, even Hongkong and foreign countries. In addition to the local fruit merchants, the wholesalers from Beijing and Tianjin came to Xuanhua selected, placed the order before the mature of grape in summer, and transported the matured grape afterwards.
SUGGESTED ANNEXE 4. Photographs

Bird view the landscape of Xuanhua’s vineyards

Bird view the landscape of Xuanhua’s vineyards
Xuanhua’s traditional funnel shaped vineyard

The diversity of plants in Xuanhua’s vineyards
The grape excavated from
Zhang wenzao tomb

The Liao Dynasty tomb
The wine excavated from Liao Dynasty tombs
温酒图

The murals in Liao Dynasty tombs

The United Nations Food and Agriculture Organization experts inspecting Xuanhua’s vineyards
Participating the Globally Important Agricultural Heritage Systems forum held in Crab island, Beijing

Participating the Globally Important Agricultural Heritage Systems Forum held in Japan
75-year old vineyard owner

The ancient city of Xuanhua