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## **Successful Practice of Soil and Water Conservation and Mountain Village Construction —— The Investigation of Qiannanyu's Ecological and Economic Valley Construction**

### **Brief Introduction**

China is a mountainous country with 2/3 of the total area being taken by mountains with distinct topographical relief. Most of the eastern mountainous areas are in a monsoon region. The rainy season is July and August. This rainy season accounts for 60% to 80% of the annual precipitation. Geological and geomorphological conditions and seasonal rainstorm are the main causes of soil erosion in China. Due to China's large population, there's a scarcity of arable land. This has resulted in deforestation as people cleared land for farming and firewood. Oftentimes this land is steep and rocky, leading to a higher risk of landslides and soil erosion. Due to the lack of scientific planning and suitable measures to address local conditions, and the inefficient use of resources in mountainous areas, it is difficult for people to improve their living standards. This has become the stumbling block of building a moderately prosperous society.

This essay will provide a successful case for the perfect combination of soil and water conservation, ecological protection and economic development in the vast mountainous areas through the investigation and study of the Ecological and Economic Valley Construction in Qiannanyu.

**Key Words:** water and soil conservation, Ecological and Economic Valley Construction

### **Abstract**

This passage introduces the Ecological and Economic Valley Construction in Qiannanyu, and is divided into three parts. First, pointing out the distributive conditions, social background, and the necessity of soil and water conservation in Qiannanyu region. The second part discusses the rationality, feasibility and advantages of Ecological and Economic Valley Construction in Qiannanyu, and explains the perfect combination of ecological, economic and social benefits brought by the pattern. The third part demonstrate the effectiveness of the Qiannanyu model to other rural areas in the low mountains and hill areas. It also clarifies the remaining questions and provides constructive suggestions for the future development of Qiannanyu's Ecological and Economic Valley Construction.

### **Background**

Qiannanyu is located in a deep mountainous area, 60 kilometers west of Xingtai County, Hebei Province. There are 451 households and 1530 people in the village. Qiannanyu possesses 448 acres of cultivated land and 8300 mu of forested area. In the 1950s, Qiannanyu was a poor village suffering from devastating floods. The whole village was washed away twice, after the two major floods in 1963 and 1996. 8330 mu of land was all destroyed, causing a rapid decline in the productivity of the land in the whole mountain area. Villagers were living a miserable and impoverished life.

The devastating flood of 1963 awakened the people of Qiannanyu. They recognized the necessity and urgency of following the laws of nature, conserving water and soil, keeping the harmony between man and nature, and enriching people with ecological construction. Through

investigating and exploring the problem of soil erosion time and time again, the community, with the encouragement and support of local government, developed four major methods to address this major problem: replanning the usage of land, undertaking water conservancy projects, afforestation, and small watershed management. Following the catastrophic flood in 1963, the people of Qiannanyu began to plant trees and practice the principles of afforestation. They carried out these measures in a systematic order. First, they began to build fish-scale pits, which are small pits planted with locust trees or oak trees, which have the effect of loosening and improving the soil. These two tree species have shallow roots, dense crowns, and strong adaptability to mountain soils. They are also the most important fast-growing trees in the world. An additional benefit of the locust trees is that their flowers and leaves can be very nutritious when used for making rice and pancakes. They can help reduce high blood pressure and prevent diabetes.



Today, Qiannanyu has 10 main trenches, 72 tributary trenches, 32 hilltops, 8300 Mu of forested area, and more than 50 different species of trees. Vegetation cover rate in Qiannanyu is 94.6 % and forest-cover rate is 90.7%. In 1995, it was one of five hundred winners of the United Nations Environment Programme award for environmental protection. Qiannanyu was granted the reputation of "the greenest place in Taihang Mountain" and "the Pearl of Taihang". It was designated as a National Forest Park, a National Water Conservancy Scenic Spot, and one of ten national soil and water conservation demonstration areas. Qiannanyu has developed to be a comprehensive scenic spot which combines sightseeing, summer vacation, scientific investigation, and traditional education.

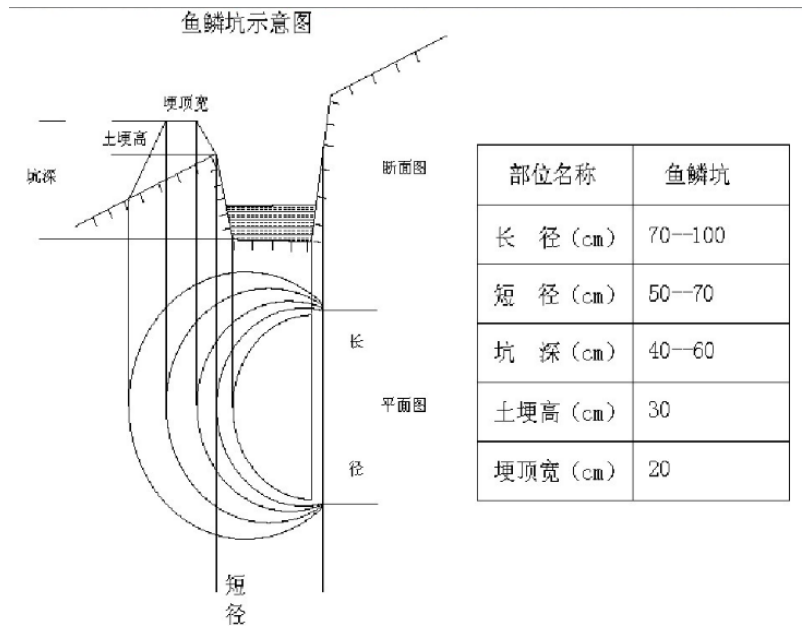
### **Soil and Water Conservation——Various Measures for the *Ecological and Economic Valley Construction***

#### **·Engineering Technical Measures**

1. The creation of the *Ecological and Economic Valley Construction* plan has formed an innovative and effective three-dimensional agriculture model. The highest altitude in Qiannanyu is about 1100 meters above sea level, the base elevation is 500-600 meters above sea level. Facing different requirements because of the gentle and steep slopes, Qiannanyu's leader took the strategy of stereoscopic development. The leaders of Qiannanyu developed a plan for vertical distribution of the trees. It has now formed a pattern with forest trees on the mountain top, nut trees on the mountain side and fruit trees at the foot of the mountain. At present, there are about 400,000 different kinds of trees in the forests, such as locust, oak and so on at the top of the mountains,



which not only conserve water and soil, but also form commercial forests. On the hillside, people constructed terraces, dug horizontal ditches, and planted fruit trees as well as 300,000 chestnut trees on the slope on the mountainside. These construction advances hold back the rain water and the soil it carries. At the foot of the mountain, people planted a variety of fruit trees, the majority of them are apple trees. Although apples require higher soil quality than chestnut trees, in order to manage them conveniently, they were planted in an orchard at the mountain foot. While acquiring good ecological benefits, the building of this tourism orchard, which imported 22 fruit tree varieties from 9 countries, became one of the major income sources of Qiannanyu as a tourist attraction.



2. The *Ecological and Economic Valley Construction* method is based on the principle of economic, ecological and social benefits, and has implemented comprehensive mountain, water, forest, field, and road management. In China, soil erosion is a primary reason for water pollution. Water Pollution of the Yangtze River is a clear example of the damage that soil erosion can cause. Small watershed management methods used in Qiannanyu included building 15 comprehensive water conservancy projects, such as blocking, storing, slowing down and draining off water. Sewage must go through three barriers: fallen leaf and turf, slope engineering, and check dams. In this way, no matter how heavy the rainstorm is, water flowing down the hill is always crystal clear. Qiannanyu's people formulated development strategies in the light of local conditions. For large areas which have heavier precipitation, the leadership would be sure to watch and manage the valley more closely, as well as make the most effective plan to reduce the intensity of the water flow in order to minimize the chance that it would scour the hillside of rich fertile soil. For areas which have steep slopes and strong storm runoff, villagers would use explosives to break up compacted soil, and dig fish-scale pits to plant trees which store water. In areas that have lower slope and a smaller water potential, villagers dug horizontal ditches perpendicular to the slope so as to store water and soil effectively terracing the mountainside. They also adopt a combination of methods that included terraces and ditches, ponds and dams, fish-scale pits, and plants all to reduce erosion and maintain soil on the mountainside.

**·Biotechnology Measures**

3. Recycling of waste. The concept of *Ecological and Economic Valley Construction* in Qiannanyu was highly advanced and it fully utilized all resources, which can be illustrated in the treatment of fallen leaves, fruit, and dead branches. The whole town has approximately 300 tons of fruit that rot on the ground every year. The village leaders contacted an enzyme manufacturing company to glean and sell the fallen fruit. The most rotten fruits will be processed into agricultural fertilizer or used as feedstuff.

Dry branches and fallen leaves will be transported to garbage disposal sites and be processed. Some will be used as plant specimens for research and study. Qiannanyu's leaders cooperated with the Department of Botany of XingTai University, to establish a plant herbarium and use the specimens for education. In addition, Qiannanyu has converted a variety of deciduous leaves into botanical specimens and arts and crafts. Qiannanyu's village leaders hope that the industrial transformation of Qiannanyu will also be able to develop the city into a cultural industry. This

method is also a perfect combination of ecological benefits and social benefits, it provided a worthy example for other rural mountain areas.

#### · **Comprehensive Utilization of Agricultural Technology Measures:**

The creation of *Ecological and Economic Valley Construction* in Qiannanyu reached the perfect combination of ecological, social and economic benefits. The forest and fruit industry are the primary industries of Qiannanyu. In the 5810 acres forests of Qiannanyu, more than 4200 acres are chestnut trees and about 500 acres are apple trees. Qiannanyu was gifted with nearly 10,000 mature chestnut trees which were hundreds of years old. Chinese chestnuts mostly grow in low hills, gentle slopes and riparian zones. They prefer fertile, well-drained soil, but they can also grow well in fairly dry, rocky, or poor soils as well. They also produce a better crop when subjected to cool temperatures during the [dormant](#) period. Chestnuts like a full sun position, and are resistant to drought, water logging, and harmful gases as well. At present, Qiannanyu has more than 200 thousand chestnut trees. The output of mature chestnut fruit is about 700 tons, and the cost is approximately \$0.5 per kilogram. After processing, its value will increase to approximately \$1.75 per kilogram. Qiannanyu currently has a contract to provide small package sales of chestnuts for Shenzhen airlines.

Apple output per acre is 500 kilogram, net income is \$1493—2239 per acre, and its profit rate is approximately fifty percent. 60% to 70% of the apples were picked up by tourists, and the remaining 30% of the apples were processed into chips, which were ordered to be sold or exported to Taiwan and Southeast Asia. The annual output of apple chips are more than 200 tons. The output value of an unprocessed apple is \$2-3, and the total value of processed apple in the form of apple chips can increase the value by 3-4 times.

#### · **Practical Management Measures**



The realization of the direct ecological and economic income, the government's policy support, the close cooperation of science and technology colleges and enterprises, the humanized management of the leaders and the proper development strategies are all conducive to the return of talents and the sustainable development of Qiannanyu. Villagers are managed uniformly and they are able to get free education and training in the best practices of agricultural techniques. At the end of each semester, the leaders of Qiannanyu would hire experts to conduct evaluations and allocate work according to everyone's exam results in order to best match the position with the villager's skill set and intellectual capacity. In Qiannanyu, the villagers all work together as production team, and a variety of responsibilities will be assigned to them by the leaders. The leadership treats each production team as a unit, distributes their working areas, records the work points, and pays wages according to each person's work points at the end of the year. Most villagers showed great satisfaction with this policy. A Qiannanyu's leader explained that their developmental ideology is "Looking at the mountains, looking at the water, and remembering our nostalgia". This concept vividly embodies the unique "human touch" and humanistic feelings of Chinese policy, which is based on the sense of responsibility and feelings to unite people and gather strength for development. In addition to the efficient construction of Qiannanyu, the leaders of Qiannanyu dedicate themselves to serving the village, and to protecting their ecological resources. Their spirits are worthy of our worship and admiration.

## **Problems**

Although the Ecological and Economic Valley Construction model of the Qiannanyu is very advanced, through my investigation of the model, I discovered some problems that could be improved and put forward some constructive suggestions.

1. The first problem I noticed is weak brand consciousness. Based on the current trend, domestic consumption is gradually moving from commodity consumption to brand consumption. On China's most popular consumer website Taobao, Qiannanyu's chestnut product could not be found. Leading brands such as "The Emperor of the Grain", "Three Squirrels", and "Zhenan Chestnut" dominate the market. Although Qiannanyu's brand promotion received heavy pressure from the fierce chestnut brand competition, and it is restricted by its medium chestnut output and geographical conditions, the experts estimate that the European and American chestnut markets still need 400 thousand tons of chestnuts, and the domain continues to grow. The price of chestnuts in the international market is about \$2000 per ton, while the price of chestnuts in the domestic market is only about \$824 per ton, with an upward market trend. Qiannanyu could learn from Zhenan's marketing mode, and further

develop the international market, by considering selling chestnuts to neighboring Japan, Australia or other countries nearby. I suggest that Qiannanyu improve Internet sales, explore the international market, upgrade their technological infrastructure, raise capital investments, and develop Qiannanyu's brand awareness.

2. In Qiannanyu, The land is owned by the collective, but individuals enjoy usage rights. Villagers have full autonomy to make their own managerial decisions and take responsibilities for their profits and losses, which leads to unmonitored spraying of unqualified pesticides and chemical fertilizers. Therefore, the quality and safety of their products, fruits and nuts can not be guaranteed. In addition, the inefficient and poorly managed use of their land resources can not be ignored. Therefore, I suggest Qiannanyu's leaders hold more community meetings, and develop village rules and regulations to manage the villagers' planting behavior and monitor the quality and quantity of the pesticides and fertilizers. Also, experts can be hired regularly to educate villagers about pesticides, plant selection, and to raise their awareness about green agriculture.
1. Lack of innovation, insufficient quantities of high-quality products, and unimaginative and monotonous attractions hinder the further development of Qiannanyu. The current methods and attractions put forth by the management are unattractive to tourists. There are several obstacles to Qiannanyu becoming a popular tourist destination. The picking price is much higher than the actual price of the product, so it is difficult to convince visitors to become regular customers of the "pick your own" fruit orchard. Most of the orchards are presently in infant stage of development. Due to a single function and industrial structure, Qiannanyu's business model is mainly based on cultivation, fruit picking and sightseeing. Therefore, I have several suggestions for Qiannanyu: reduce the cost of picking, make full use of its historical cultural advantages, develop its special "chestnut culture", take advantage of the internet to organize and publicize major community activities (such as "Chestnut Culture Festival", agricultural knowledge prize giving competition, and fruit picking competition). In addition, they should harvest the wealth of ideas from their community and consumers through questionnaires, community meetings, and feedback forms. The ultimate goal is to form an intensified, three-dimensional and innovative business model by providing high quality products, teaching others about their cultural heritage and the Qiannanyu spirit, and developing open and cultural-oriented tourism.



2. I suggest that Qiannanyu fully utilize the "Internet +" trend and develop a thriving e-commerce presence. Through my investigation of Qiannanyu, I found that the farmers that were 45 years old and over were mainly engaged in physical labor, while the younger generation in the village were unsatisfied with the current commercial structure and chose instead to seek work in bigger cities. This phenomenon indicates that Qiannanyu's economic development model relies too heavily on "manual labor" alone, which does not meet the younger generation's needs for various occupations and career tracks, leading to a brain drain. According to the China Electronic Commerce Research Center, the scale of rural online shopping market is increasing by 40% annually and it is expected to exceed 600 billion yuan in 2018. Therefore, I suggest that Qiannanyu expand their markets through the Internet sales platform. E-commerce elements can be added into their enterprise management and internal business processes. For external industries, the development of e-commerce will activate and promote a series of upstream and downstream industries such as inventory control, shipping and packaging, distribution logistics, marketing, brand development, and location based services, this will lead to a second tier of careers in support services, such as construction, drivers, heavy equipment operators, Information Technology support, data management and analyses, and IT infrastructure management. In addition, it will also help to guide the innovation and upgrading of related service industries such as, traffic control, hotel managers, cleaners, buyers of the food and product, waitresses, and cooks. In this way, individual needs of various regional groups will be met.

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