

## Discussion on Modern Agricultural Science and Technology Demonstration Garden with the Guiding of Agricultural Ecotourism-analyzing Conception Planning for Modern Agricultural Science and Technology Demonstration Field of Ten Thousands' Mu Coffee and Nuts of Huaqiaoba

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**Abstract:** Modern agricultural science and technology demonstration fields emerge and flourish with the increasing of the adjustment of agricultural industrial structure and the rising of characteristic ecotourism. The study tried to discuss the modern agricultural science and technology demonstration garden with the guiding of agricultural ecotourism by analyzing conception planning for modern agricultural science and technology demonstration field of ten thousands' Mu coffee and nuts in Huaqiaoba, Mangshi, Dehong, Yunnan. The planning respected current situation of natural ecology, established a tourism theme image of "planting coffee trees and also drawing golden phoenixes" in view of SWOT analyzing of ecotourism, put forward a planning idea of "nature and ecology, culture and human, science and technology and modern" and especially expounded the structure of total planning layout of "one axis, one circle, one nucleus, sixteen areas and twenty four points" and the contents of specific functional areas around three key functions: coffee planting demonstration, agricultural ecotourism, industrial leisure vacation.

**Keywords:** Agricultural ecotourism, agricultural science and technology demonstration garden, conception planning, landscape architecture, Mangshi, SWOT analyzing

### INTRODUCTION

In 1994, Beijing established a high science and technology agricultural field by importing Israel's technology in Tong County; meanwhile, Shanghai also established a high science and technology agricultural demonstration field in new bridge, Pudong. Both two fields that featured in facility agriculture and simple agriculture became model of modern agricultural fields of the first generation throughout the country. Later period of the 1990s modern high science and technology agricultural fields began to break through original simple agricultural production pattern and to develop towards agricultural visiting tour. It is purely not a gathering of some agricultural technology measure, also not a simple superimpose of agricultural production and landscape elements, but a complicated comprehensive system as a new garden type (Wei and Li, 2003). The operating form of agricultural production with the character of "agriculture + tourism" can not only develop agricultural production, maintain eco-environment, develop agricultural tourism, but also reach to an aim of enhancing farmers' income and booming country's economy (Mingwei *et al.*, 2008; Hongfei *et al.*, 2007).

Both science and technology demonstration and tourism development are basic contents in the planning and construction of modern agricultural science and technology demonstration fields and both are not only contradictory but also dependent. The graceful environment of modern agricultural science and technology demonstration is a foundation and premise of tourism development and tourism development also will have some influence and destroying on modern agricultural science and technology demonstration. Fortunately, ecotourism is a kind of tour on the basis of nature and emphasizes contribution to protection (Xiaoli *et al.*, 2006), so that developing modern agricultural science and technology demonstration garden with the guiding of agricultural ecotourism, in which the balance of protection and utilization is emphasized, is a better way to develop tourism of modern agricultural science and technology demonstration fields. How to plan modern agricultural science and technology demonstration fields with the guiding of ecotourism reasonably, thereby to utilize resources of modern agricultural science and technology demonstration fields sustainably and to express its industrial comprehensive functions properly is the most real and significant task. The study

discussed modern agricultural science and technology demonstration garden, taking modern agricultural science and technology demonstration field of ten thousands' Mu coffee and nuts in Huaqiaoba, Mangshi, Dehong Yunnan as a example, by means of analyzing its conception planning around three key functions: coffee agriculture science and technology demonstration, agricultural ecology tour visiting, industrial leisure vacation.

## **CURRENT SITUATION AND SWOT ANALYSIS**

### **Current general situation of the region and site:**

**Geographical location and planning scope:** The site is located on northeast of Mengga town, Mangshi city, 12 km away from government of Mengga town, belonging to Mengwang, Xiangtang and Mengwen village committee and the area is about 8091.1 thousands m<sup>2</sup>, with the scope of east to Shuangnaobao mountain, south to coffee site of Hebian stockaded village and big channel of power station, west to Qingshu piedmont of Dangliang separating channel, north to coffee site of Gangou level ground and under big channel of Shuangbao.

**Area conditions:** Mangshi city is a seat of Denghong autonomous prefectural government, important city of national construction opening towards southwest, hinge of traffic and economy of future China towards Indian Ocean and South Asia and also is key belt of processing trade of coffee planting in Denghong autonomous prefectural. It takes over 20 min to get the site from Mangshi and beauty spots of Sanxian hole and Laopo forestry park, Heihe will be got with the distance not exceeding 30 km from the site, so the area location is very superior.

**Natural environmental conditions:** The site gives first place to valley and flat, presents long trend, distributes high mountains along two sides, but the mountain is gradual and not so high. The climate belongs to south subtropics semi-moist monsoon climate, the quantity of heat is enough, the water and humid is middle, the sunshine is rich, there is gentle frost in winter, where is one of the most suitable areas for planting of coffee and Australia nuts in China. The soil mainly is red soil, the quantity of fertile is adequate. The vegetation cover rate can reach above 72% on the site area.

**Humanities history and social conditions:** The city location of Mangshi is "flower and fruit city, coffee metropolis", international festival for coffee culture will be held every year beginning from 2011, now it has successfully been held twice. The area takes the first place to minority humanity and culture of Dai race, Jingpo race, etc. and has a long history. At present, the industry mainly is agriculture in the area, the type of

land mainly is plowland, involving 26 villager groups, peasant 1080 families, 5400 persons.

**Infrastructure conditions:** Currently, there is one 7~8 m wide highway connecting Mangshi and outer Hebian stockade and running through the whole site, the grade of the highway is higher and the situation of road surface is well. In addition, there are road infrastructures such as 125 provincial road, country paths, machine-plowing roads, etc. Water conservancy canals are more perfect and has infrastructure of electric power, communication, etc.

### **SWOT analysis of ecotourism:**

**Current situation and evaluation of ecotourism resources:** There are exiting tour resources of 242788 m<sup>2</sup> forestry park, 34017 m<sup>2</sup> wildlife breeding field of Mangshi tour scenery spot, hot spring, Danglian river, village, mountainous region, farmland, etc., in the area, the types of resources are abundant and more unusual, mountain and rivers may be beautiful and the beautiful scenery is pleasing on the whole, which establishes a well foundation for constructing facilities and contents of coffee experience, government reception, visiting tour and leisure vacation.

### **Strength analysis:**

- The industrial foundation is better, planting of coffee and nuts, breeding of wildlife and propagation of domestic animals and birds, etc., have had a better foundation.
- The site is mainly valleys and flats, secondly mountains, so industrial planting is easier and feasible.
- There is a Danglian river through the site, adding a big channel of Gelang river power station, hot spring, irrigation canals and ditches, water resources is rich. The soil is fertile and can guarantee the basic conditions of the main industry of mixed-planting of coffee and nuts.
- The climate of the area is suitable for developing standard and modern three-dimensional agriculture.
- The infrastructure is more perfect in the site, the traffic is convenient and the road net of interior traffic has some foundation.
- The resources are more abundant in the site, suitable for giving first place to the industry of coffee and nuts, combing other functions of ecotourism, leisure vacation, etc., to create a comprehensive modern agriculture science and technology demonstration field.

### **Weakness analysis:**

- There have been some road net in the field, but interior traffic is not unobstructed, does not form a

loop, which may result that industry circulation is not unobstructed.

- The water for irrigation, production and life need to match related facilities for collecting, storing and drawing water.
- The electricity for life and production need to newly construct related electric power facilities.
- The winter may have frost in some individually cold year, so planting field suitable for coffee need to be selected seriously and the avoiding-cold environment should also be select according to opposite temperature features in order to be planned.

**Opportunity and threat:** The industry of mixing planting of coffee and nuts and the three-dimensional planting agriculture are stressed to develop, the industry development prospect of which is vast because it is much more unusual, the risk of homogenization is lower and there is not corresponding scale project to compete around this area, even the whole nation and entire world.

#### PLANNING IDEA AND TOTAL FUNCTIONAL LOCATION

**Tourism theme image:** There is a poem sentence which means that Chinese parasol grows exuberantly, thus phoenix will be drew to sing in <The book of songs• Daya>. So, people extend it as: planting Chinese parasol tree, phoenixes may come naturally.

Coffee garden grows exuberantly, fruits abundantly, which naturally lead to industry prosperous and economy rich; Huaqiaoba, ten thousands' coffee garden site, picturesque scenery, where people are outstanding and lands are effective. The shape of the site likes a fluttering golden phoenix among the mountains overlooking at high place, which is natural and lucky and shows honor and sustainability of Hougu coffee enterprise. That is: "planting coffee trees may also draw phoenixes to come".

**Planning idea:** Followed the principles: natural ecology prior, showing coffee culture, local minority culture and Southeast Asia, economic and saving, embodying border city and tropical local characteristic, order and sustainable development and people first to carry out specific planning, confirmed total planning idea: "Hougu coffee garden, ecological Huaqiaoba", which can specifically be analyzed by 6 key-words:

- **Nature and ecology:** Hot spring, rivers, channels, ponds, trees, countryside, mountains, villages....., stepping into which is putting into the embrace of big nature, therefore, the planning followed an idea of fusing with nature, reduced destroying natural

eco-environment to the greatest extent and fulfilled "manual works, but like natural".

- **Culture and people first:** Embodying details and connotation of culture, especially coffee culture and history, regional Southeast Asia cultural characteristic and minority folkways and culture of local Dai race, Jingpo race, Deang race, etc., in the planning. 'People first' mainly considers tour participation and experience, satisfies tourists from six aspects: eating, living, transportation, traveling, buying, amusement.
- **Science and technology modern:** Mainly embody three-dimensional tour agriculture of three-dimensional planting of coffee and Australia nuts, Chahua chicken breeding with mixed-planting, etc., to fully show charm of modern agricultural science and technology demonstration.

**Total functional location:** Relying on better natural eco-environment, the foundation of characteristic coffee planting, deep cultural tradition, countryside scene and location superiority, complying with the development trend of modern three-dimensional agricultural ecotourism, to create a modern agricultural science and technology demonstration field relying on natural ecology, treating coffee culture as details, developing all kinds of experience of three-dimensional planting of coffee and nuts, ecotourism, leisure and vacation, etc., as main function (Fig. 1).

#### Total planning layout and functional area:

**Total planning layout:** Following total planning layout idea of combing natural, primary and secondary clear, district and point matching, adjusting measures to local conditions, function (industry) prior, landscape cooperating, using convenient, combing comprehensive analysis for ideal goal and functional location, formed total planning layout structure: "one axis, one circle, one nucleus, sixteen areas and twenty four points" by analyzing basic materials about conditions of the site terrain, land use, resources of water and forest, distribution of villages and farmlands and environmental space, etc., "one axis", one blue axis formed by Danglian river landscape belt; "one circle", main road loop surrounded by existing highway and planning road; "one nucleus", centric area consisted of existing wildlife breeding field (Mangshi tour area), original forestry park and comprehensive architecture group planned mainly to give first place to reception centre, etc.; "sixteen areas", sixteen main functional area: drop irrigation for mixed-planting of coffee and nuts, spurting irrigation, reception center, original forestry park, wildlife breeding field, hot spring club, showing for coffee varieties, first processing factory, commanding department, mixed-planting of fruits and vegetables, experiment area for mixed-planting of characteristic forest, experiment area for mixed-breeding of Chahua chicken, entrance, new



Fig. 1: Master plan



Fig. 2: Total planning layout structure

cooperation, advertising wall for enterprise LOGO, wetland ecology garden. “twenty four points”, twenty four main representative scenery spots and functional points, including hot spring reception center, pools, coffee museum, showing center for coffee products, coffee experience museum, peasant family experience garden, first processing factory, commanding building, accommodation, MINI thousands’ islands lake, tour pavilion, animals viewing and admiring, repast, bridges, Danglian river landscape belt, etc., (Fig. 2).

### Functional area (Fig. 3):

- 6670000 m<sup>2</sup> three-dimensional agricultural demonstration garden for mixed-planting of coffee which is Yunnan little granule species and

Australia nuts: to realize the function of planting demonstration, mainly be divided into two typical area: drop irrigation area and spurting irrigation

- **6670 m<sup>2</sup> comprehensive architecture group:** To gather official reception, coffee experience, tour sightseeing, leisure vacation into a whole
- 667000 m<sup>2</sup> experiment area for breeding Chahua chicken in coffee and nuts field
- **242788 m<sup>2</sup> forestry park:** Including experiment area for forestry coffee, the ancients ruins, Baoshan temple, Dimu temple, original valley rainforest, to sufficiently develop exiting flourishing original forest and gather forest convalescing, forest landscape and forest tour into a whole
- **34017 m<sup>2</sup> area for wildlife breeding, viewing and admiring:** Including all kinds of rare wildlife of peacock, wild boar, horse deer, etc. To use exiting



Fig. 3: Functional area

- wildlife breeding site to reform and promote and realize the function of animals seeing, breeding visiting, characteristic catering, etc
- **3335 m<sup>2</sup> hot spring leisure club:** To develop exiting hot spring resources, to realize the function of hot spring rest, meanwhile catering, accommodation, entertainment, etc
- **20010 m<sup>2</sup> expo for coffee planting:** Showing and demonstration of all kinds of coffee varieties
- **Experiment area for mixed-planting of coffee and characteristic fruit trees:** Including economical forest of walnut, red flower oil tea, southwest birch, etc., each 33350 m<sup>2</sup>
- **Entrances:** To hold the post of gallery of coming in and going out and image advertising, mainly are two entrances connecting Mangshi and Hebian stockade and entering into inner of the site
- **Commanding department and first processing factory:** Main function is to offer place and architecture for work, management and commanding of ten thousands' demonstration field and catering, accommodation and etc., of related staffs and the first place is practical, to satisfy first processing craft requirement, taking account of landscape and leisure
- **Peasant family experience garden:** To be promoted and reformed on the base of reserved Gangouping village, have the function of catering, accommodation, farming amusement, etc
- **Cooperation:** Accomplishing according to constructed mode
- **Reception center:** Including 3335 m<sup>2</sup> thousands' islands lake, spurring irrigation area, etc., important buildings of reception building, coffee museum, showing hall for coffee products, coffee experience building, etc., to satisfy the functions of reception, meeting, visiting, education, etc

- **Expo and spurring irrigation of coffee planting:** To show coffee varieties and landscape of mixed-planting combining spurring irrigation
- **Drop irrigation of coffee mixed-planting:** Is main content of the area, combining drop irrigation, to show the charm of the science and technology of coffee mixed-planting
- **Wetland garden:** Locates near the entrance of outer Hebian stockade, plants plant suitable for water on the wide place of Danglian river, to add tourist contents and scenery spots

## CONCLUSION

In consideration of the length of an article, the above only discussed the main contents of conception planning for modern agricultural science and technology demonstration field with the guiding of agricultural ecotourism on the whole. The planning enlightened that: the development of modern agricultural science and technology demonstration garden by means of ecotourism can promote local economy development and green infrastructure construction, during the construction process, landscape architecture will play an important and pivotal role day by day. As a new garden type, modern agricultural science and technology demonstration is obviously limited by conditions and area, so not only functional theme but also landscape contents should have its characteristic respectively because of different project and site environment in the process of planning and design, moreover, the research and practice about which both need to be pay more attention.

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