



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Land Demand and Land Use Regulation for the Building of International Tourist Island in Hainan Province

LI Bin^{1,2*}, GAO Yuan¹, LIN Bo¹, LUO Sheng-wei¹, LI Gang¹, LI Xiao-ye¹

1. Land Consolidation Center, Department of Land, Environment&Resources of Hainan Province, Haikou 570203, China; 2. Inner Mongolia Academy of Agricultural and Animal Husbandry Sciences, Hohhot 010032, China

Abstract We conduct analysis on the urban construction's demand for land, tourism's demand for land, infant industry's demand for land and infrastructure's demand for land in Hainan Province, respectively, and forecast the amount of newly-added land in Hainan Province in 2015 compared to 2008. Based on regional characteristics, we analyze the main problems in land use in Hainan Province, and work out the regional land use regulation plan, to provide scientific guidance for the building of International tourist island in Hainan Province.

Key words International tourist island, Demand for land, Land use, Regulation direction

Hainan Province is the largest special economic zone and the only tropical island province in China, which has unique advantages in promoting the strategic adjustment of economic structure, developing low-carbon economy, and promoting the fundamental shift of economic development mode. *Several Opinions of the State Council on Promoting the Building of International Tourist Island in Hainan Province* points out that giving full play to the geographical and resource advantages of Hainan Province, building International tourist island in Hainan Province, and creating the tourist destination with international competitiveness, is a major initiative to accelerate the development of modern service industry and achieve fast economic and social development in Hainan Province, which will play an important demonstration role for the adjustment and optimization of economic structure and transformation of development mode in the whole country.

The building of International tourist island requires Hainan Province to optimize regional, urban-rural land use layout; ensure the land demand of the central cities and towns, the key development areas; improve infrastructure, optimize the layout of the road network, and ensure infrastructure's demand for land; pay close attention to environment, strengthen ecological protection, and place emphasis on landscape planning. How to ensure various types of land demand, ease the industrial and regional land use contradictions, achieve farmland protection goal, advance intensive and economical use of land resources, poses a higher requirement on the land management work in Hainan Province. There is a need to conduct analysis of the demand of construction land and regulate the land use direc-

tion, in order to better and more rapidly promote the building of International tourist island^[1–3].

1 Analysis of the total demand for construction land

1.1 Analysis of the relationship between total amount of land for construction and economic aggregate The total construction land in Hainan Province increased from 290 883 hm² in 2002 to 298 050 hm² in 2008, increasing by 7 167 hm² in total, an average annual increase of 1 194 hm². Accompanied by the expansion of construction land, Hainan's GDP also increased from 62. 489 billion yuan in 2002 to 145. 923 billion yuan in 2008, increasing by 83. 434 billion yuan in total, an average annual increase of 13. 906 billion yuan, as is shown in Table 1. For each additional 1 hm² of construction land in Hainan Province, the GDP will grow 11. 64 million yuan, indicating that there is a relatively close relationship between Hainan's rapid economic growth and land supply.

Table 1 Changes in the construction land and GDP in Hainan Province during the period 2002–2008

Year	Construction land //hm ²	GDP 10 ⁸ yuan	GDP per unit area of land 10 ⁴ yuan/hm ²
2002	290 883.2	624.9	21.5
2003	290 894.4	691.7	23.8
2004	291 903.1	819.7	28.1
2005	292 623.4	905.0	30.9
2006	293 179.6	1031.9	35.2
2007	295 861.0	1223.3	41.3
2008	298 050.2	1459.2	49.0

To better reflect the relationship between GDP and construction land, we conduct comparison between the growth of GDP and construction land, as is shown in Fig. 1. Over the time, GDP and construction land grow simultaneously, and

Received: October 1, 2012 Accepted: November 6, 2012

Supported by Department of Land, Environment & Resources of Hainan Province (20118).

* Corresponding author. E-mail: libin_kim@sina.com

thus we can determine that there is an obvious correlation between the gross domestic product (GDP) and total construction land in Hainan Province. The Pearson correlation coefficient is calculated at 0.969, and the test results reach significant level of 1%, indicating that there is a strong positive correlation between total construction land and GDP^[4].

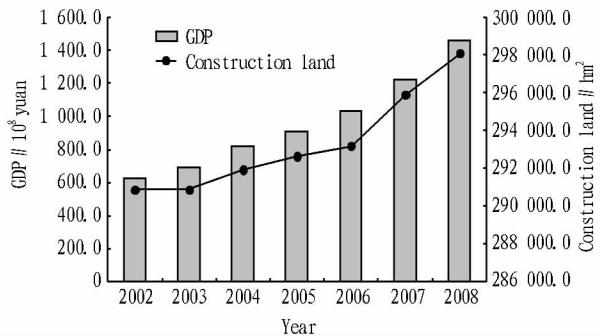


Fig. 1 Comparison between the growth of GDP and construction land

1.2 Forecast of the total construction land From 2002 to 2008, the GDP per unit area of construction land in Hainan Province increased from 215 000 yuan/hm² to 490 000 yuan/hm², an average annual increase of 45 000 yuan/hm². By exponential regression analysis, we derive that the GDP per unit area of construction land in the province will be 890 000 yuan/hm² in 2015, 1 350 000 yuan/hm² in 2020. According to the economic development objective proposed by *Hainan International Tourism Island Construction Development Plan*, the province's GDP will be 300 billion yuan in 2015, 480 billion yuan in 2020. It can be deduced that the total size of construction land in the province will be 337 080 hm² in 2015, 355 560 hm² in 2020^[5].

2 Analysis of the demand for construction land

2.1 The demand for urban land In 2008, the area of land for city in Hainan Province was 12 579 hm², and the area of land for designated town was 21 388 hm², a total of 33 967 hm² of urban land. According to the strategic tasks and priorities of the province's urbanization development, Haikou City will be constructed as the central city in the province in the 12th Five-Year plan period; Sanya City, Danzhou City, Qionghai City, Dongfang City and Wenchang City will be constructed as the second tier cities in the province; Wuzhishan City, Wanning City, Dingcheng Town, Tuncheng Town, Jinjiang Town, Lincheng Town, Baoyou Town, Yinggen Town, Baocheng Town, Yelin Town, Yacha Town and Shilu Town, will be constructed as the central cities and towns; other towns will be developed as the general towns. According to the overall land use planning of various cities and counties, the newly-added urban land will increase 16 525 hm² in 2015^[6-8].

2.2 The demand for tourism land

2.2.1 The current situation of tourism development in Hainan Province. After 20 years of cultivation and development of the province, the tourism industry in Hainan Province has had the

unique resources, environment, policy advantages that many other places of China do not have, initially forming the tourism industry system integrating six functions (food, shelter, transportation, travel, shopping and entertainment)^[9]. In recent years, with the rapid development of international tourism, the superior natural environment in Hainan Province has begun to attract more and more tourists from Europe, the United States, Japan, Korea and other countries. A lot of international travel management groups begin to be stationed in Hainan Province, and Asia Boao Forum is also held here, greatly promoting the influence and international reputation of Hainan. The tourism industry in Hainan Province develops by leaps and bounds, having developed into the characteristic pillar industry in Hainan Province.

However, the low-efficiency expansion problem is prominent in Hainan's tourism industry: simply pursuing the plane-scale expansion but ignoring the improvement in the quality of the tourism industry and the improvement in the overall economic benefits. The ordinary hotels are excess, and the annual occupancy rate is not high.

The reasons are as follows: on the one hand, the rapid landslide of real estate industry after 1993 forced a large number of office buildings and villas to be changed into city hotels and resorts, making the number of guest room grow faster than that of tourists; on the other hand, the low-level redundant construction of tourism projects results in disorderly competition and waste of resources. In terms of the development of recent tourism real estate, first, in some areas, such as Shenzhou Peninsula in Wanning City and Qingshuiwan in Lingshui County, the proportion of construction land for real estate development having not been started is still high, reflecting excessive supply of land by the government. Second, the real estate development model is single, and the functional convergence is prominent. The model used by most cities and counties is the model of " hotel + commercial housing development ", and there is a shortage of body building and health care, theme parks, tourism entertainment, tax-free shopping and other travel service products, required by the building of International tourist island. The tourism mode is single and the supporting tourism services are imperfect.

2.2.2 Tourism development goals. The requirements of the building of International tourist island are as follows: building a number of tourist attractions of the characteristics and advantages; accelerating the development of culture and sports, and other tourism-related modern service industries; maintaining stable and healthy development of the real estate industry.

First, building the key world-class tourism scenic spots, large-scale tourism projects and integrated tourism service facilities, to promote the transformation and upgrading of tourism. It is necessary to improve the function and grade of existing large scenic spots, protect and develop the gulf around the island, build large-scale international resort area, coastal ecological theme park, water sports area, coastal and island nature reserve. Based on conservation, there is a need to orderly develop national forest parks and nature reserves, build ecological

protection zone, international health area, spa area, and tropical wildlife areas; build a number of theme tourism parks of aerospace, crater, sea, tropical rain forests, mangrove wetlands, tropical wildlife and plants. In the central cities of Haikou and Sanya, Xinglong, Boao, Baocheng, Chongshan and other areas, focusing on the development of tourism and cultural entertainment, dining and lodging, sightseeing, shopping, travel and transportation industry. In the rural areas, it should build the tropical leisure agriculture demonstration area characterized by Li and Miao customs, harbor fishing village, ecological civilization village, happy farmhouse, and farm household tourism.

Second, from the actual conditions and long-term development in Hainan Province, taking tourism as leader, vigorously developing the service economy, focusing on the development of tourism real estate, entertainment and sporting tourism, cultural and creative industries and tourism exhibition industry. Intensively developing tourism real estate; building a livable ecological island, strengthening scientific planning, highlighting features; focusing on sustainable, positive and orderly development of international business center, high standard international residential real estate and resort-type tourism real estate. Building state-level international tourism and cultural industry demonstration zone, accelerating the international shopping center construction, and implementing the foreign tourists' shopping departure tax rebate policy and travelers' shopping duty-free policy. Introducing large international duty-free group and domestic large commercial joint venture to operate duty-free shops; accelerating the development of the exhibition industry and supporting the construction and improvement of the Boao exhibition service facilities, to create a number of first-class exhibition brands by 2015.

2.2.3 The demand for tourism land. In accordance with the direction of the development of tourism in Hainan, and the planning data concerning tourism project in various cities and counties, we derive that by 2015, the area of tourism construction land will increase 21 296 hm² (54 new projects, with the land area of 17 504 hm²; 20 expansion projects, with the land area of 3 792 hm²; the construction projects involving 16 cities and counties such as Haikou City, Wenchang City, Danzhou City, and Lingao County).

2.3 Infant industry's demand for land

2.3.1 The current situation of industrial development in Hainan Province. Before the establishment of the province of Hainan, the industrial inputs in Hainan were insufficient, with sluggish economy and relatively weak foundation. Since the establishment of special economic zone, the industrial economy has made dramatic progress under the support of preferential policies^[10]. Industrial structure is constantly optimized. On the original industrial basis of sugar, rubber, food, agricultural machinery, iron ore mining and small cement, a large number of industries have been gradually developed, such as car and motorcycle, chemical industry, chemical fiber textile, natural drink, electronic industry, pharmaceutical industry, pulp and processing of agricultural products. A relatively complete industrial system has taken shape. During the Ninth Five-Year Plan

period, the Hainan provincial government established the industry development strategy of "one province, two places" (newly industrialized province, efficient tropical agricultural base, tropical island leisure and vacation resort), highlighting the important position of industry in the economic structure of Hainan Province. In August 2004, the provincial government issued *Guiding Opinions on Accelerating the Development of Infant Industry in Hainan Province*, proposing the development ideas of speeding up the process of industrialization and vigorously developing infant industry. In recent years, Hainan Province has actively introduced famous enterprises at home and abroad, to build high level petrochemical project, expand and extend the oil and gas chemical industrial chain, vigorously develop oil and gas chemical industry cluster and the circular economy of oil and gas chemical industry, achieving rational use of oil and gas resources and coordinated development of economy and environmental protection, taking a new road with high technological content, good economic returns, low resources consumption, and less environmental pollution.

The main problems in the industrial land in Hainan Province are as follows: the land use is relatively extensive, the land benefit is not high, and especially the investment intensity, plot ratio, building coefficient and other indicators concerning the land for large enterprises' industrial projects are all below the control standards of Industrial Project Construction Land Control Indicators promulgated by the state. Due to large planning area, in some development zones, the development and construction progress is slow, the land supply rate and completion rate are low. In addition, since most of the development zones in Hainan Province are early set up, with changes in the internal and external development environment for the construction of development zones, the construction in some development zones (such as Guiliyang Economic Development Zone, Wenchang Economic Development Zone, Longgangwan Economic Development Zone) has been inconsistent with the original positioning of the industry, so there is an urgent need to scientifically formulate medium-and long-term land use planning for industrial development, reestablish the leading industrial functions of different development zones, make the development orientation clear, regulate the land input and output standards to promote optimal allocation of industrial land.

2.3.2 The development direction of industry in Hainan Province. The building of International tourist island requires the intensive development of infant industry and the development of high-tech industry. Adhering to the intensive development of infant industry under the principles of avoiding environmental pollution, resources destruction and redundant construction, never blindly pursuing industrial expansion at the expense of the ecological environment; relying on Yangpu, Laocheng, Dongfang, Jinpai, Changjiang and other industrial parks and development zones, taking full advantage of the existing industrial base, port conditions, key industrial parks and development zones, to vigorously optimize the industrial layout, and support the construction of new industrialization demonstration base in Hainan Province; developing high-level port industry, intensively developing

oil and gas chemical industry, integration of forest and paper, automobile manufacturing, mineral resources processing, agro-processing, pharmaceutical industry and other industries.

Heavy chemical industry is strictly limited in Yangpu and Dongfang Industrial Park; other industrial projects are concentrated in the existing industrial park. Speeding up the construction of Hainan Ecological Software Park and Sanya Creative Industry Park, to encourage and attract well-known IT companies at home and abroad to gather in the park. According to the national software industry development planning and the overall layout of industrial base construction, actively supporting Hainan Province to develop software and information service industry, gradually forming software industry base.

2.3.3 The demand for industrial land. According to the land for industrial projects in each city and county, we conduct predictive analysis of the scale of mining land: by 2005, the area of new mining land will be 6 376 hm² (26 new projects, with the land area of 3 427 hm²; 6 expansion projects, with the land area of 2 949 hm²; the construction projects involving 16 cities and counties such as Haikou City, Wenchang City, Danzhou City, and Lingao County).

2.4 Infrastructure's demand for land

2.4.1 The current situation of infrastructure building. In recent years, Hainan Province has built highway around the island; all counties (cities), townships and administrative villages have had roads. Guangdong – Hainan Railway was put into operation; Hainan West Ring Railway completed transformation; the passenger line from Sanya to Beijing, Shanghai, and Guangzhou was opened; the freight line from Hainan to major domestic cities was opened. Haikou Meilan International Airport and Sanya Fenghuang International Airport were expanded, opening 156 domestic and international scheduled airlines and many charter flights. Haikou, Yangpu and other ports were the national first-class open port.

A batch of power plants were built and 220 kV main network around the island was built, basically completing the transformation of the urban and rural power grid. Cross-sea power interconnection project was officially put into operation. In 2008, the area of land for transportation in Hainan Province was 13 757.13 hm², and the area of land for water conservancy facilities was 61 425.33 hm².

2.4.2 Infrastructure development goals.

(i) Building safe, convenient and efficient transportation system. Perfecting the transport infrastructure conditions in the island, promoting the work of the Qiongzhou Strait Tunnel Project; accelerating the construction of highway from Haikou to Guangzhou to Nanning. Transforming Haikou Meilan International Airport and Sanya Fenghuang International Airport; accelerating the construction of the Boao airport; doing a good job in airport siting and project construction in the central and western regions; strengthening the building of port infrastructure and the collection and distribution system; forming the port pattern with complete functions as soon as possible; actively promoting the construction of passenger liner, yacht marina; initiating the transformation of West Ring Railway and Yangpu branch line railway projects; steadily advancing the midline and east – west

line highway construction; upgrading the existing technical level of national highway, provincial highway; strengthening the construction of transport facilities leading to the tourist attractions; improving the rural road traffic conditions.

(ii) Strengthening the infrastructure construction of energy and water conservancy. Further optimizing the energy structure, and increasing the proportion of clean energy; promoting the Changjiang nuclear power project; actively developing new energy, such as wind energy, solar energy, tidal energy and biomass power; accelerating the transformation of urban and rural power grid, timely starting the cross-sea power grid interconnection to promote the power protection capacity; accelerating the development of Yangpu liquefied natural gas project, gradually building the gas line network connecting the island's major towns and major scenic spots to substantially promote the civilian gas coverage; vigorously promoting the construction of water conservancy infrastructure; on the basis of good environmental impact argument, starting construction of the Hongling Dam and Irrigation Project, completing the previous work of Tianjiaotan, Maiwan and other reservoirs, to basically solve water shortage in Hainan Island.

2.4.3 Land demand.

(i) Transportation land. Meeting the needs for road construction land, such as bridge spanning the sea, West Ring Railway electrification reconstruction, highway construction, reconstruction project of national highway and provincial highway, connection lines between tourist attractions, and rural highway; ensuring the construction land for capacity expansion and transformation of various ports, Haikou Meilan International Airport, Sanya Fenghuang International Airport, the Boao airport and the Yanzhou airport. It is predicted that the area of newly added land for transportation is 7 678 hm² (34 new projects, with the land area of 6 024 hm²; 20 expansion projects, with the land area of 1 654 hm²).

(ii) Water conservancy facility land. Giving priority to guaranteeing land for Hongling reservoir, Tianjiaotan reservoir, Maiwan reservoir and other key water conservancy facilities; protecting the construction land for irrigation and water conservancy facilities. It is predicted that the area of newly added land for water conservancy facilities is 5 150 hm² (11 new projects, with the land area of 1 240 hm²; 6 expansion projects, with the land area of 3 910 hm²).

(iii) Energy land. Meeting the land demand of the urban and rural power grid renovation, and wind energy, hydropower, nuclear power and other clean energy projects; ensuring the construction of the oil reserve base and the South China Sea oil and gas resources development and service base. The area of newly added energy land is expected to reach 542 hm².

3 The problems in regional land use and the regulation direction

In summary, in the "Twelfth Five-Year" period, Hainan Province will have a huge demand for construction land. If following the traditional land use pattern, Hainan Province with shortage of land resources needs to bear a lot of pressure. Therefore, it is necessary to adapt to the carrying capacity of resources and environment based on the socio-economic development, make the land use regulation direction clear, and

achieve fundamental change in land use pattern^[11].

In accordance with the principles of conducting to unified planning, unified development, integration of resources, giving play to the overall advantage of the resources, the protection of the ecological environment; in accordance with the guiding ideology of coordinating the urban and rural development, coordinating regional development, coordinating economic and social development, coordinating development of man and nature in harmony, and coordinating the domestic development and opening to the outside world, the whole island of Hainan is planned into five groups: the northern group (including Haikou City, Wenchang City, Ding'an County, Chengmai County, with a total area of 8 017 km²); the eastern group (including Qionghai County, Wanning City, with a total area of 3 648 km²); the southern group (including Sanya City, Lingshui County, Baoting County, Ledong County, with a total area of 6 962 km²); the western group (including Yanzhou City, Dongfang City, Lin'gao County, Changjiang County, with a total area of 8 606 km²); the central group (including Wuzhishan City, Qiongzhong County, Tunchang County, Baisha County, with a total area of 7 190 km²). The study relies on these five groups to conduct the regulation of land use.

3.1 The northern group In this region, the proportion of construction land and the share of arable land in agricultural land are large; the proportion of garden plot and woodland is the lowest in the province. The main problems in land use in this region are as follows: the contradiction between human and land is obvious; there is a huge demand for construction land; the construction land, and especially the land for rural residence are extensive. This region has obvious advantages, where the land was developed and utilized early, with high cultivation rate and dense population and urban; the industrial system basically takes shape. It is an important agricultural production base and the province's transportation and commercial center, and also the region with the greatest economic strength in Hainan Province. The future development of this region should to take Haikou as core to lay emphasis on the development of efficient tropical agriculture, modern city, modern industry, modern service industry, and tropical coastal tourism; strengthen the collaboration and division of work within the region.

Direction of land use regulation: based on the functional positioning of this region in Hainan Province, focusing on the development of metropolitan industrial area, to meet the urban industrial land demand, and ensure the construction land for tourism, exhibition, logistics, high-tech industry, higher education and other modern service industries. The land should be ensured for the construction of ports, roads, and other infrastructure projects. The mining land and land for industrial projects should be concentrated in several key industrial parks, such as Haikou and Chengmai, and it is necessary to strengthen the planning, rational distribution, conserve land and improve land use efficiency. This area should reduce the woodland growth rate, adjust the woodland structure, stabilize the area of farmland and garden plot, improve the pasture quality, and reduce the area of unused land.

3.2 The eastern group The area has rich tourism resources, good conditions for development of tourism resources, and developed tourism industry, which is the key de-

velopment area in the eastern tourism industry belt. Meanwhile, it is also the province's important grain production base and oil production base. The main problems facing the land use in this area are as follows: the arable land is severely destroyed; with the rapid development of industrial and mining sectors, the land pollution is increasingly prominent, exerting the impact on the development of regional tourism resources and the development of agricultural production. In the future, this area should rely on the Boao Forum for Asia, to create the eastern coastal tourism industry belt integrating tourism entertainment, vacation and exhibition; by virtue of the Longwan international hub port construction, actively participate in the international geographical division of labor, strive to become a bridgehead for foreign exchange; vigorously develop the port economy, logistics economy, drive the traditional processing industry of tropical agricultural products, aquatic products, and livestock products; encourage the development of new capital-intensive and technology-intensive industries, such as information and medicine; vigorously develop efficient, specialized, large-scale and intensive international tropical modern agriculture, strive to build it into a high-quality vegetable supply base for the province and the country.

Direction of land use regulation: making every effort to build the eastern coastal tourism belt, strengthening the tourism infrastructure construction, improving the overall level of tourism services, improving the overall development intensity of tourism, promoting the intensive use of various types of construction land, strictly controlling the occupation of arable land, preserving the high-quality agricultural land in this area, concentrating the industrial development in several important industrial parks, such as Qinglan Economic Development Zone and Longwan Port Economic Development Zone, improving the scale merit of land development.

3.3 The southern group The main problems in the land use in this area are as follows: the land ecosystem is fragile; steep slope cultivation, deforestation, and other acts aggravate the soil erosion; the degree of land use is low. Tropical coastal resort of Sanya as the leading tourism site enjoys a high domestic and international reputation. At the same time, this area has favorable agro-climatic resources, prominent advantages of tropical crops and fruits, which is a famous southern breeding species base in China. In the future, the development of this area should integrate tropical coastal tourism of Sanya, Lingshui and Ledong, to create an international tourism brand; rely on superior development of agricultural resources in this area to develop the modern tropical agriculture represented by off-season vegetables, flowers, and crops.

Direction of land use regulation: ensuring the land for development of tourist facilities; controlling the construction land within the tourism region; improving the efficiency of land use; adjusting the structure of agricultural land; actively carrying out land consolidation, reclamation and development; accelerating the development of tropical high-efficiency agriculture; increasing the area of urban industrial and transportation land, especially the land for the Sanya urban construction and land for the transport facility construction in the mountainous areas.

3.4 The western group The main problems in the land use in this area are as follows: there is a huge demand for the construction land, and the mining land is used extensively; the

drought is widespread, and it is faced with the problem of land desertification, leading to low comprehensive production capacity of agricultural land. It is the area with the most abundant mineral resources in Hainan Province, and an important industrial production base, with a certain basis of heavy industry production. The production of rubber and other tropical crops has obvious advantages. It should rely on Yangpu Development Zone, Dongfang Chemical City, Changjiang Industrial Park and other key industrial parks, to focus on the development of heavy and chemical industries, and also take into account the development of the industries of paper making, sugar making, rubber making and woodwork processing, foster rational industrial structure system, and build it into the western industrial corridor in Hainan Province.

Direction of land use regulation: rationally arranging land for industrial projects; developing heavy industry towards the intensive direction, occupying farmland as little as possible; reasonably expanding the scale of urban land, and strengthening the construction of infrastructure, especially the construction of port and transport facilities; paying attention to the construction of water conservancy facilities, ensuring the water supply for industry and agriculture; enhancing the ability of agriculture to resist drought; ensuring the quantity and quality of the development of cultivated land in this area, laying stress on the land development and consolidation in this area.

3.5 The central group The main problems in the land use in this area are as follows: the level of development and utilization of land is low, the level of output and benefit of land is low; the land ecosystem is extremely fragile; the urban and rural residential land is used extensively.

Qiongzhong District is the ecological conservation area in Hainan Province, the birthplace of the island's major rivers, the region with the richest forest resources in Hainan Province, and an important pillar for the ecological balance of the entire island. The land use within the area has a very important impact on the quality of the ecological environment in Hainan Province. Currently in this area, the traffic conditions are poor; the population density is low; agriculture is dominant, and the farmers in some remote mountainous areas have not yet shaken off poverty. This area should give a priority to the protection of sources of rivers, water conservation areas and biodiversity; achieve the combination of ecological and environmental protection,

(From page 32)

security for the all-round development of agricultural standardization in the region.

Agricultural standardization work requires innovation. At present, agricultural standardization work in Zhejiang Province must be based on the leading agricultural industries in Zhejiang Province, for guiding the enhancement of the whole industry chain. We must introduce the concepts of cycle and ecology, and put the development of circular and ecological agriculture on the standardization track, to better serve the province's ecological civilization building. It is necessary to adhere to innovation, to fully demonstrate the advanced features of agricultural standardization in Zhejiang Province, making full use of some characteristics in Zhejiang Province, such as

restoration and economic development; focus on the development of eco-industries, mountain agriculture, mountain tourism and folklore tourism.

Direction of land use regulation: ensuring the ecological land, land for transportation facilities, land for the urban development and land for tourism facilities; limiting mining land, strengthening the protection of basic farmland, and reasonably arranging returning farmland to forest.

References

- [1] ZHANG GY, SUN Q, WU JM. Construction land analysis and appropriate utilization suggestions in Binzhou City[J]. Shandong Land and Resources, 2007, 23(6): 91–94. (in Chinese).
- [2] DAN CL. The study on economic society and building land demand of undeveloped region[J]. China Business and Market, 2007(9): 59–61. (in Chinese).
- [3] YANG JX. Analysis of non-agriculture construction land in Xinjiang [J]. Journal of Xinjiang Agricultural University, 1998, 21(3): 243–248. (in Chinese).
- [4] LI B, LI XY, HE XW. Study on performance evaluation for land consolidation project [J]. China Science and Technology Information, 2011(7): 304–305. (in Chinese).
- [5] DUAN ZL, ZHANG XL, QUAN XY. Analysis of construction land by back–propagation neural network model with Xinjiang as a case [J]. Journal of the Graduate School of the Chinese Academy of Sciences, 2009(4): 451–457. (in Chinese).
- [6] DOU HC, DENG SJ, WANG L, *et al.* Development of urban construction-land planning management system[J]. Beijing Surveying and Mapping, 2007(2): 32–35. (in Chinese).
- [7] CAO N, CAO MM. Driving force of construction land use change in Xianyang City[J]. Bulletin of Soil and Water Conservation, 2009, 29(5): 123–126. (in Chinese).
- [8] ZHAO JQ. Simple analysis on city planning and optimal land utilization[J]. Shanxi Architecture, 2002, 28(6): 4–5. (in Chinese).
- [9] ZOU W, FU GJ. Investigation and analysis of natural environment in Hainan international tourism island[J]. Journal of Anhui Agricultural Sciences, 2010(19): 10285–10288. (in Chinese).
- [10] LI YL. An empirical study on effects of agricultural structure readjustment in Hainan on agricultural economic development[J]. Journal of Anhui Agricultural Sciences, 2011(12): 7501–7502, 7540. (in Chinese).
- [11] CHEN XZ, YANG XM. Land development and consolidation in Henan Province[M]. Zhengzhou: The Yellow River Water Conservancy Press, 2010. (in Chinese).

the original developed economy, export-oriented agriculture, the fine tradition of intensive cultivation and relatively high quality of laborers.

References

- [1] ZHOU JH, HE LQ, JIN SS. Extension system of agriculture standardization in Zhejiang Province[M]. Hangzhou: Zhejiang University Press, 2009. (in Chinese).
- [2] LIN XH, MO HF. Research on mechanism of action in agricultural standardization[J]. Journal of Anhui Agricultural Sciences, 2006, 34(5): 1025–1026. (in Chinese).
- [3] JING YQ, LIU CL, YING CJ. Existing problems and countermeasures of agriculture standardization development in China[J]. Acta Agriculturae Jiangxi, 2009, 21(1): 176–177. (in Chinese).