

# The Dilemma and Path Optimization of Characteristic Agriculture Development from the Perspective of Rural Revitalization

## -- Based on Donggang Strawberry Industry Analysis

Chongyu Xu<sup>1, a</sup>, Chaolin Li<sup>2, \*</sup>

<sup>1</sup> School of Finance, Anhui University of Finance and Economics, Bengbu, Anhui, China

<sup>2</sup> School of Economics, Anhui University of Finance and Economics, Bengbu, Anhui, China

<sup>a</sup>2490537199@qq.com, <sup>\*</sup>952587990@qq.com

### Abstract

Cultivating and developing rural characteristic agriculture according to local conditions and driving farmers' income with "industrial prosperity" is the necessary way to implement the strategy of rural revitalization. From the perspective of rural revitalization strategy, this study attempts to take the development process of strawberry industry in Donggang City, Liaoning Province in the past 30 years as an example, collect relevant materials and data about the development history of the nationally famous "Donggang strawberry" industry, analyze the successful factors of local characteristic agricultural development to drive farmers' income increase and rural revitalization, as well as the difficulties and bottlenecks of further development, and propose the path and measures for optimizing development. From special to general, this paper summarizes and analyzes the common problems that need to be solved in the modernization of rural agriculture with Chinese characteristics and puts forward corresponding countermeasures.

### Keywords

Characteristic Agriculture; Agricultural Industrialization; Facility Agriculture; Optimized Path.

## 1. Introduction

In China, a traditional agricultural country, rural development cannot be neglected in building a strong modern socialist country and a moderately prosperous society in an all-round way. The 19th National Congress of the Communist Party of China proposed "implementing the strategy of rural revitalization", which pointed out the road and direction for realizing agricultural modernization and solving the problems of "three rural areas". Among them, "industrial revitalization" serves as the foundation and prerequisite for the five aspects of rural revitalization, creating a new rural development situation of "industrial prosperity, ecological livability, rural civilization, effective governance, and affluent life". However, the industrial development of rural areas is fundamentally different from that of urban areas. It is necessary to adhere to the key point and central point of agriculture, look for cash crop varieties suitable for the development of the region and with outstanding "welfare effect" to develop characteristic agriculture, and make scientific plans for the content and structure of characteristic agriculture. Through the industrialization, modernization, marketization and informatization of characteristic agriculture, it is necessary to develop characteristic agriculture. Make characteristic agriculture become the main reliance on agricultural upgrading, farmers' prosperity and rural prosperity, change the traditional production mode and income pattern that mainly rely on food production, and on the basis of taking into account

food security, promote the integration of three industries with characteristic agricultural development, narrow the gap between urban and rural areas, and solve the worldwide problem of "rural decline" in the process of modernization.

In recent years, many experts, scholars and government departments have focused on agricultural development and farmers' income, from how to strengthen agricultural industrialization and marketization, how to vigorously develop characteristic agriculture, how to develop leading enterprises to drive industrial upgrading, and how to promote the rapid development of agricultural and rural economy through farmers' cooperatives. How to use "Internet +" to promote the development of rural characteristic industries, how to strengthen the construction of talents to promote the development of characteristic agriculture and other aspects, comprehensive research has been carried out in an all-round and multi-angle, and has achieved fruitful results. This study takes the key role played by a representative characteristic agricultural product "strawberry" in promoting farmers' prosperity and rural development in a county as an example, summarizes the factors of its current achievements, the difficulties and bottlenecks of its current development, puts forward the path of optimizing development, and analyzes the common factors and requirements of the development of rural agriculture with characteristics in China by "taking points and aspects" and "taking small ones as big ones". The common constraints of the current development, the road map of future development optimization, and the industrial support policies that the state can and should give, etc., provide certain references and enlightenment for rural areas across the country to develop their own characteristics of agriculture.

## 2. Basic Situation of Strawberry Industry Development in Donggang

Strawberry is also called cranberry, raspberry, etc., is a common name for strawberry plants in the rose family. The appearance of strawberry is approximately heart-shaped, delicious red and tender, rich aroma, sweet and sour pulp juicy taste excellent, and rich nutritional value, is one of the world's top ten fruits, known as the "Queen of fruits" [1]. Donggang City of Liaoning Province (under Dandong City) is located in the eastern part of Liaodong Peninsula and the north coast of the Yellow Sea. It is located in the internationally recognized high-quality fruit zone at 40° north latitude. It has a suitable climate, fertile soil and abundant water, which provides good ecological conditions for the growth and development of strawberry.

Although Donggang is one of the main strawberry producing areas that was first introduced and developed continuously in China, it is mainly cultivated in the open field for a long time, with small planting area, large seasonal restrictions, and low economic benefits. It is mainly cultivated by farmers spontaneously and self-sufficient, and only a few villages have a certain scale as a side business. After the 1990s, with the development of the national market economy and the expansion of strawberry market demand, strawberries have become an important cash crop, and the planting area has begun to increase rapidly, especially the rapid development of strawberry facilities such as sunshine greenhouses and plastic arched sheds, and the economic benefits of off-season cultivation have been greatly improved, and many farmer families have become rich. The strawberry industry has grown into a pillar industry of Donggang characteristic agricultural development and rural revitalization. In 2021, the number of strawberry employees in Donggang City is nearly 100,000, the strawberry planting area is 201,000 mu, and the total output is 316,000 tons, accounting for 7.5% and 11.7% of the national strawberry area and output, respectively. The output value of fresh fruit reaches 6.3 billion yuan, and nearly 40,000 tons of strawberry products are "flying" to the country and the world, and are welcomed by consumers at home and abroad. The export earned more than 35 million US dollars, accounting for more than 90% of the country's exports [2]. "Donggang Strawberry" has become a national well-known geographical indication agricultural product brand with

standardized production, brand management and quality traceability, and Donggang has become an important base for strawberry production and export in China.

### **3. Successful Elements of Strawberry Characteristic Agriculture Development**

Donggang City makes full use of the resource endowment and favorable conditions of local strawberry cultivation, and after nearly 30 years of cultivation and development, the single agricultural product with regional characteristics has realized industrialization in the whole region, and the planting area, output and efficiency have been greatly improved, which has played an unprecedented role in increasing farmers' income and getting rich (the per capita income of farmers is 11,538 yuan). The strawberry industry has become a pillar industry for the agricultural development and rural prosperity of Donggang City (the total output value of strawberries accounts for 16% of the total output value of agriculture, forestry, animal husbandry and fishery of the city). It is the first batch of demonstration counties named by the Liaoning Provincial government as "one county, one industry". There are many factors contributing to its current development achievements, among which the most important are the following:

#### **3.1. Facility Agriculture to Transform Traditional Agriculture**

Donggang relies on facility agriculture to change the traditional cultivation and planting methods of strawberries bound by the natural growth cycle and achieve off-season production and sales, which is the fundamental reason why the strawberry industry can develop in scale and industrialization, and grow into a pillar industry of high-quality and characteristic agriculture in the region and an important source of rural revitalization. From 1924 to the 1980s, strawberry cultivation is open flat or small ridge way, cover straw winter at the end of autumn, spring blossom and fruit, completely dependent on natural climate conditions, fruit small and general color, inconvenient management, low yield (200 ~ 300Kg per acre), poor economic efficiency, long-term can only be used as a sideline in a few villages. In the late 1980s, after the introduction of the planting model of early spring arch shed and solar greenhouse, the economic benefits were improved, and the attractiveness of farmers was enhanced, forming the coexistence of three models. However, since the 1990s, due to the characteristics of open-air planting with low input and low output, input-output in the arch shed in early spring, and high-input and high-yield in the solar greenhouse (taking 2019 as an example, per unit of yuan/mu, open-air cost is 3570 and net income is 2530; Vault cost 12500, net profit 12500; The cost of solar greenhouse is 35600, the net profit is 24400), and the planting mode shows a trend of rapid development of solar greenhouse, fluctuating development of open-air strawberries, and shrinking development of arch shed in early spring. Among them, open-air planting was 4,000 mu in 1991, 25,000 mu in 2019, and the highest peak was 38,000 mu in 2003 and 2010. Early spring arch shed from 5000 mu in 1991 to 1000 mu in 2019, the highest peak is 29000 mu in 2009; The solar greenhouse was 3,000 mu in 1991 and 122,000 mu in 2019 [1]. Solar greenhouse strawberries are listed in autumn and winter, especially during the Spring Festival, not only the strawberry quality and taste are better, but also become one of the most popular fruits in the winter market (the unit price of high-quality varieties per pound can be maintained at 40 to 50 yuan for several months, and the short-term highest price can reach 100 yuan), but also extend the growth and market time of fruit, and make full use of land and rural leisure labor. The economic benefits are greatly improved, and the attraction of farmers is enhanced, so the rapid expansion has become the main body and the most important source of income of strawberry planting industry, and the welfare effect of farmers' income is obvious. The open-air strawberry products are mainly used for deep processing and fresh fruit sales in the surrounding suburbs, and are still able to maintain a certain level of production.

### **3.2. Scientific and Technological Innovation Provides Strong Support for Industrial Development**

The national first-class level of science and technology is the biggest help for Donggang strawberry quality and high yield and even the continuous growth of the industry. For nearly 30 years, Donggang strawberry industry from strawberry seedling breeding, variety renewal, cultivation forms, soil disinfection, shed structure, artificial light, assisted pollination, pest control, temperature control, quantitative fruit and fruit, CO<sub>2</sub> gas fertilizer application, water and fertilizer integration, fresh packaging, pollution-free production, green food production and organic production of more than 30 aspects of scientific research and technological innovation. And summarize and promote advanced production technology, lay a solid foundation for the development of strawberry industrialization, so that Donggang strawberry has a unique market competitiveness, Donggang City will eventually become "China's first strawberry county". Established in 1992, the Strawberry Research Institute (now the Liaoning Strawberry Science and Technology Institute) undertakes the tasks of new varieties cultivation, new technology promotion training and service guidance, virus-free seedling production and strawberry fresh packaging technology research and development, and so on. At present, more than 20 new and excellent varieties and more than 30 advanced production technologies at home and abroad have been promoted. For example, Donggang was the first to carry out virus-free tissue culture seedlings in the country, and the application rate of virus-free seedlings in the city is more than 90%. The majority of farmers have also invented and innovated many technologies in production practice, such as the all-steel solar greenhouse, the characteristics of different varieties of flowers and fruits, which are not only used locally, but also promoted to the whole country.

### **3.3. Market-oriented Information Technology Will Expand the Space for Industrial Development**

Marketization and information-based production and sales are catalysts to promote the upgrading of the traditional strawberry industry and grow from agricultural and sideline industries to pillar industries. Strawberry is a berry, short shelf life, transport loss, in the past long-term sales in the local market, limiting the growth of scale and efficiency. With China's economic development and the improvement of people's living standards, people's consumption power continues to improve, coupled with the solar greenhouse strawberries in winter, to fill the market berry products blank, quality and taste of strawberries become hot products, and in recent years, with the help of packaging logistics industry and e-commerce development, smoothly out of remote county-level cities, sold to the whole country, to the world. It has solved the problem of "high quality and low price, and no increase in production and income". At present, only 10% of strawberries are used for local fresh fruit sales or processing, and 90% are sold all over the country in fine packaging, which enhances the product value. For example, in 2019, SF Express, Jingdong Express and other large enterprises launched a strawberry supply chain solution in Donggang City, providing a full range of services of "business flow + logistics" and "online + offline" for strawberries, and carrying out innovation and upgrading from the aspects of origin sourcing, logistics distribution, production and marketing docking (at present, "aviation + high-speed rail + land transportation" can be reached in 48 hours in most provinces). The majority of farmers and government departments develop "Internet +" business, promote in Tiktok, Kuaishou, Taobao, etc., cooperate with Jingdong, Tmall, Hema fresh, daily fresh and other high-end e-commerce platforms to help agricultural products "sell, sell well and sell far", constantly improve the visibility and influence of Donggang strawberries, and promote the sale of agricultural special products to the country and the world.

### 3.4. Standardization Construction to Establish Quality and Brand

Maintaining product quality and establishing brand reputation is the cornerstone of sustainable development of Donggang strawberry industry. "Donggang Strawberry" has established a standardized production system for the purpose of the standardization construction of the three-level seedling system, the standardized production of fresh fruit strawberries, and the standardization of the quality grade of fresh fruit strawberries. For example, the development of the "Strawberry virus-free seedling production technical regulations", clear the quality standards of each link of strawberry from the original seedling, the original seedling to the improved seedling breeding; The Technical Regulations for the Production of Green Strawberries have been formulated to clarify the standards and specifications for the production of solar greenhouse, early spring arch shed and open field strawberries from planting, water and fertilizer management, plant management, disease and pest control, fruit picking, storage and transportation. The "Donggang Strawberry" fresh fruit quality Standard "was formulated, and the standard requirements for the" Donggang Strawberry "fresh fruit grade of super grade, first grade and second grade were clarified. At the same time, improve the strawberry quality traceability system, implement the strawberry quality and safety certificate system, establish a quality and safety supervision platform, strengthen market supervision such as pesticides, and enhance the internal quality and brand value of products. "Donggang Strawberry" has been in the World Strawberry Congress and China Strawberry Culture Festival for many times, and has won more than 90 gold MEDALS and more than 130 silver awards, and has been evaluated as the most influential and popular regional public brand of agricultural products in the country for many consecutive years, with a brand value of 7.75 billion yuan.

### 3.5. Comprehensive Development of Primary, Secondary and Tertiary Industries has Improved Performance

It is an important feature of the development of Donggang strawberry industry to promote the construction of the whole industrial chain, promote the integration of the first, second and third industries, form an industrial cluster effect, and enhance the comprehensive competitiveness of the industry and income generation ability. Over the years, Donggang has built a production model of "company + base + farmers", "enterprise + farmers + base", "professional cooperation organization + farmers + base", and formed a complete industrial chain of trade-industry-agriculture integration of seedling cultivation, planting, preservation, processing, marketing, export, scientific research and related equipment production. For example, the strawberry planting industry takes the construction of the national modern agricultural industrial park as an opportunity to promote the development of sporadic planting to large-scale planting, and the concentration of more than 50 acres of large-scale planting communities reached 80, 324 cooperative production, and 49 family farms; Make green and organic strawberries a new growth point, and build a national export strawberry quality and safety demonstration zone. The secondary industry mainly focuses on low-cost open-air fruits, promotes the in-depth processing of strawberries, and increases the added value, forming more than 30 varieties in 16 series, including canned strawberry, strawberry wine, strawberry jam, strawberry freezing point, strawberry pastry, strawberry beverage and frozen granule [1]. The three industries focus on the development of sorting, packaging and processing, e-commerce sales, rural tourism and picking.

### 3.6. Unified Government Planning and Policy Support

The unified planning and policy support of Donggang Municipal Party Committee and municipal government for the development of strawberry industry is an indispensable factor for Donggang strawberry industry to grow bigger and stronger. For example, the introduction of the "Donggang Strawberry" certification trademark use management Measures ", regulate the

use of "Donggang strawberry", a geographical indication certification trademark registered by the State Administration for Industry and Commerce in 2004, and enhance brand protection. National Strawberry Culture festivals were also held in 2011 and 2016 to expand the popularity and influence of the "Donggang Strawberry" brand in the international and domestic markets. The Interim Measures for Donggang to Support the Development of the Strawberry Industry and the Guiding Opinions on Accelerating the Development of E-commerce in Donggang have been issued, and a number of support policies have been implemented to safeguard the development of the "Donggang Strawberry" industry. Support strawberry intensive processing leading enterprises, in the land transfer, administrative charges, tax support and other aspects of support; Encourage enterprises to build strawberry production bases by striving for superior financial support and coordinating financial departments to innovate special financial services for strawberry loans. Compiled the Development Plan of Modern Agricultural Industrial Park (Strawberry) in Donggang City, Liaoning Province, and the Development Plan of 10 billion output value of Strawberry in Donggang City to promote the benign development, transformation and upgrading of "Donggang Strawberry".

#### **4. Difficulties and Bottlenecks Encountered in Strawberry Industry Development**

Donggang City, Liaoning Province has strawberry, a high value-added agricultural product with unique climate and soil conditions and good planting tradition. Relying on the reform and opening up, especially the development of the market economy, the strawberry industry has been cultivated and developed into a well-known characteristic agricultural demonstration area and a main strawberry producing area in China. The strawberry industry is also a pillar industry of the city's (county's) agricultural development. It will make greater contributions to increasing farmers' incomes and promoting rural revitalization. At present, Donggang strawberry industry has gone through the initial stage of the development of general rural characteristic agriculture, and entered the relatively mature middle stage with large planting and operation scale, the integration of the first, second and third industries, and enjoys high popularity and brand effect. However, from the situation of the past two years, the development trend of rapid expansion has slowed down, and the bottlenecks or difficulties encountered in the process of sprinting to the advanced stage of comprehensive strength and market competitiveness need to be solved or overcome.

##### **4.1. The Land is Small and Scattered**

Donggang City is the traditional land of fish and rice, rice is the main grain production, and the dry field is small and scattered. At present, the planting area of the strawberry city (county) has reached 200,000 mu, and 15 towns (streets) under the jurisdiction of the strawberry planting industry, the trend of rapid increase in the total area of strawberry planting in the past two years has been slow. In view of food security and other factors, the quantitative expansion is no longer sustainable (there is already a lot of dry land occupied, there is not much dry land suitable for growing strawberries, and any further increase will affect the area planted in dry land food crops). At the same time, the scattered land and the rural land contract management system, so that strawberry farming does not break away from the main status of farmers, although agricultural cooperatives have made great progress, the government is also promoting the strawberry planting modern industrial park project, but the proportion of the total planting area is still not high (there are only six townships), the scale of land concentration is limited. Therefore, the amount of available land and the scale of contiguity land are important bottlenecks in the development of Donggang strawberry industrialization, affecting the intensive use of land resources and the modernization process of characteristic agriculture, which is not conducive to the development of strawberry industry to a higher stage.

#### **4.2. The Size of Strawberries is Limited by Policies**

Strawberries can achieve higher benefits through anti-season installation planting. At present, the planting area of high-input and high-yield solar greenhouses accounts for a relatively high proportion of the total planting area (12,200 mu of solar greenhouses in 2019, with a total area of 14,800 mu, accounting for 82.4%). When the total area growth is restricted by land supply, Originally, the room for growth was limited, and at present, the state has comprehensively considered various factors such as ecology, market and protection of food production stability, and has changed the original active support policy, but mainly to maintain the stability of the existing scale, limiting the approval of the construction of new solar greenhouse facilities. Donggang strawberry planting has changed from quantity growth to quality growth, and the whole strawberry industry has changed from extension growth to convolution growth, which has become a new topic for Donggang strawberry characteristic industry to further expand and strengthen.

#### **4.3. The Restriction of Traditional Agricultural Production Mode to Agricultural Modernization**

The system of collective ownership of rural land and household production contract determines the laborer - farmer who has been engaged in agriculture for a long time, not only occupation, but also identity. At present, the strawberry industry in Donggang City is mainly engaged in rural collective identity of farmers, farmers, and the population of farmers is also the current rural left-behind personnel, cultural quality is generally not high. As the urban-rural dual development pattern has not fundamentally changed, the trend of rural talent loss has not changed because of the increase in agricultural income than in the past, which is reflected in the fact that college students from rural areas, even agriculture and forestry majors, no longer return to rural areas after graduation. Cities also attract young migrant workers with a certain level of knowledge, while rural areas and agriculture are not attractive enough for high-quality workers. At present, a certain number of government agricultural technicians provide technical services for farmers in Donggang City, which can cope with the relatively traditional agricultural production mode at present. However, in order to cope with the future modernization of agriculture and promote the sound integration of the three industrial chains, the current workers still have a large lack of age structure, knowledge structure and market awareness.

#### **4.4. There are Still Bottlenecks in the Three Industrial Upgrading and Integrated Development**

The relatively scattered strawberry planting in Donggang brings difficulties to technical service and quality management. At present, the proportion of green and organic strawberries is not high enough, leading planting enterprises or cooperatives are not many, not strong, and the phenomenon of uneven products on the market still exists, which is not conducive to agricultural industrialization and brand and reputation upgrading. The fruit value of strawberry off-season planting is high, so it is mainly to solar greenhouse planting fresh fruit sales in winter. And only 10% of the total output of open-air strawberries (some local fresh fruit sales), due to low cost is suitable for deep processing, limiting the development of the secondary industry, and deep processing product varieties mining is not enough, the contribution to the output value and income is not large. The leading enterprises are not strong enough to guide the planting industry, and there are only 4 large-scale enterprises with more than 100 million yuan. As the local historical celebrities, historical monuments and other humanistic resources in Donggang are relatively few, the rural infrastructure construction is generally backward, and the connection between the development of strawberry industry and national culture, food culture and other aspects is not enough, and the tertiary industry forms related to strawberry

such as leisure agriculture, tourism agriculture and experience agriculture are not rich enough. At present, a small number of picking, experiential tourism, etc., do not have scale and lack of characteristics. The shortcomings of the three industrial development have also brought constraints to industrial integration and upgrading.

#### **4.5. Lack of Market Supervision and Anti-risk Ability**

First, there are still weak links in market regulation. Although Donggang has established a standardized strawberry production system and has strict law enforcement and supervision, the phenomenon of non-local strawberries impersonating Donggang strawberries occasionally affects market management and brand protection. There are also some problems that affect the reputation of "Donggang Strawberry", such as the unqualified product quality of some farmers who do not join the cooperative or the unstable quality of some cooperative fresh fruit products. Second, the ability to resist risks is still lacking. The ability of both farmers and cooperatives to cope with market risks and unexpected risks is not strong enough. For example, during the epidemic period in January and February 2020, the price of strawberries fell by 30-60%, and the total loss of farmers was 200 million yuan. The planting cost of strawberry facilities in winter is relatively high, and farmers may suffer large losses when disaster weather such as heavy snow has an impact on logistics or price fluctuations are relatively large, which affects farmers' planting enthusiasm, the development and growth of enterprises and the stability of industrial development. At present, although there are financial awards and subsidies such as financing risk deposit projects to provide certain anti-risk measures, the development of order agriculture is insufficient, the insurance industry is not enough to intervene in the strawberry planting industry, the lack of targeted insurance types, and the anti-risk ability of the entire industry is not enough to support the industry to grow bigger and stronger.

### **5. Path Optimization of the Strawberry Industry Development**

The development of Donggang strawberry industry has stepped out of a special agricultural revitalization road of "establishing brand, cultivating market and strengthening industry", and has made a unique contribution to promoting farmers' prosperity and rural revitalization. However, there are still some difficulties and bottlenecks in the original development mode and road, and it is necessary to optimize the industrial development path in order to achieve the development goal of "10 billion output value" as soon as possible, and consolidate the status of Donggang as the largest strawberry production and export base in the country and the "first county of strawberries in the country".

#### **5.1. Strengthening Intensive Land Use**

The core of the bottleneck of the development of Donggang strawberry industry is the lack of conditions to promote agricultural modernization, and the primary problem is land resources. To optimize the development path of strawberry industry, it is necessary to further integrate land resources, create conditions to change the state of land fragmentation, segmentation and small use, such as through centralized living measures, the farmers' private land, idle or abandoned land concentrated contiguously, and expand the centralized use of land resources; We should break the restrictions on the land use form of farmers, small cooperatives and village collectives, reasonably implement the transfer of land use rights, establish the land stock cooperation system, and promote large-scale agricultural management mode with large enterprises, large agricultural industrial parks and large agricultural cooperatives as units. Only in this way can a new agricultural development system featuring centralized land use and large-scale production and management be formed. Increase the degree of intensification of the agricultural industry [4].



## 5.2. Strengthening Implicit Growth

After years of quantity and scale expansion, under the circumstance of limited land supply in the region, it has become urgent to promote the transformation of Donggang strawberry planting industry to the development mode of conformal growth. The first is to further strengthen scientific research and technology promotion, and continuously improve the scientific and technological content in the aspects of seedling breeding, varieties, fertilization, disease and pest prevention, and facilities, reduce planting costs, and enhance the market competitiveness of products. At the same time, strengthen the concept of green development and ecological development, increase the planting proportion of advantageous varieties, green strawberries and organic strawberries, and increase the output and added value of high-end fresh fruits. In addition, explore the combination of strawberry planting production materials with other high value-added varieties, with other agricultural planting, aquaculture production, etc., to form ecological chain agriculture, circular agriculture, improve comprehensive benefits, and protect land and agricultural ecology.

## 5.3. Promoting the Integrated Development of the Three Industries

On the basis of strengthening the strawberry planting industry, the proportion of open planting and installation planting should be rationally allocated, and low-cost strawberries should be used as the main raw materials for deep processing to improve the comprehensive benefits of open planting. At the same time, we will explore and develop deep processing products that make use of high-cost strawberries, such as strawberry freezing point, strawberry pastry, and high-end strawberry drinks, expand the market for high-end products, and reduce the current consumption pattern that mainly relies on edible fresh fruits. Promote the integration of production, education and research, agriculture, industry and trade, especially promote the development of large enterprises that integrate the three industries, guide and drive the integration and integration of the three industries with leading enterprises, and improve the overall competitiveness and efficiency of the industry. Increase investment in infrastructure and the tertiary industry, expand the format of the tertiary industry, tap cultural resources such as culture, folklore, history, and promote the deep integration of agriculture and culture, agriculture and tourism, agriculture and leisure, so that more citizens and tourists to outing, leisure picking, experience life, experience culture, to be a happy and civilized "urban farmer".

## 5.4. Transforming Traditional Agricultural Production Methods

Change the current strawberry planting mode, which is mainly produced by farmers and cooperatives, to the planting mode dominated by large agricultural industrial parks and enterprises. In Donggang City, it is explored that farmers or village collectives buy shares with collective land use rights, set up large-scale agricultural industrial parks or enterprises, not only concentrate on the use of land, but also change the traditional production mode, transform farmers into agricultural laborers and agricultural workers, promote the industrial division of labor among farmers according to their ability and quality, and change the small agricultural production mode to agricultural specialization and large-scale production. At the same time, large enterprises, especially those with the integrated development of the three industries, have the conditions to attract urban talents in agriculture, management, information, scientific research and other aspects to work in rural areas, improve the attractiveness of agriculture and rural areas, reverse the trend of rural hollowing, so that the development of characteristic agriculture can better promote rural revitalization.

## 5.5. The Government has Increased Investment and Policy Support

In order to further promote the industrialization and modernization of the development of the strawberry industry, the government needs to increase investment and support, promote rural urbanization, improve production and living facilities, provide education, medical care,

information, transportation and other public services, narrow the gap between urban and rural areas, and lay a more solid foundation for attracting talents and attracting enterprise investment in rural areas. In addition, we can take into account the characteristics of different towns and villages and different villagers' organizations, explore and introduce policies and measures for land transfer, centralized use, and rural consolidation and reorganization, take into account basic grain production, development of specialized agriculture, and rural development, advance the modernization of traditional agricultural production methods in an orderly manner, and realize mechanization of grain production and installation of specialized agricultural production. The government has increased investment in risk funds and policy support for industrial development to provide necessary guarantees for financial enterprises such as banks and insurance companies to support industrial development, especially to support the development of large enterprises and large industrial parks. For example, for enterprises to order, facilities, land as a guarantee to provide certain guarantee support to bank loans; Support insurance companies to innovate "insurance types", provide necessary insurance for the development of strawberry planting industry to encounter natural disasters, unexpected risks, etc., and stabilize the development of strawberry industry. We will support the development of financial markets and develop new financial products such as contract agriculture and strawberry futures.

### **5.6. Strengthen Industry Self-discipline and Market Supervision**

Donggang Strawberry Association was separated from the Research Institute in 2019 and independently assumed the functions of industry self-discipline and management. It is necessary to give full play to the role of the strawberry industry association, strengthen the self-discipline and self-management of the strawberry planting and deep processing industry, support good enterprises, cooperatives, and farmers to develop the strawberry industry, carry out technical training for strawberry industry practitioners, urge the industry to implement the quality standards stipulated by the government, strictly control the quality of the entire product, and standardize the "Donggang strawberry" logo and traceability distribution work. The relevant competent departments of the government should further strengthen market supervision, supervise and investigate the illegal use of the "Donggang strawberry" logo, and strictly prevent foreign products from posing as Donggang strawberries. Strengthen the inspection and testing of products, from the quality level, whether the use of pesticides, etc., to prevent agricultural products that damage the reputation of "Donggang Strawberry" brand from entering the market.

## **6. Conclusion and Suggestions**

The promotion of rural revitalization is inseparable from the modernization of characteristic agriculture, and Donggang City in Liaoning Province provides a typical example for this -- building the largest strawberry production and export base in China, making "Donggang strawberry" a national Geographic indication product, the internal factors of its success and the difficulties or bottlenecks faced by its future development. It has a strong reference significance for all parts of the country to drive farmers to get rich and promote the whole rural revitalization.

### **6.1. The Development of Characteristic Agriculture Requires the Establishment of Special and Excellent Varieties of Agricultural Products**

Many places in the country are practicing the model of "one county, one product", "one township, one product" and "one village, one product". However, there are still few cases that really reach the development level of Donggang strawberry industry. The fundamental reason for Donggang City to build a strawberry characteristic industry of "one county and one product"

is to find the strawberry, a characteristic high-quality agricultural product with high added value, suitable for local ecology, and able to extend the second and third industrial chain. Therefore, the establishment of suitable for local characteristics of agricultural varieties, is an important issue, to look at the country and the whole world, scientific selection of "special" and "excellent" agricultural varieties. Form a pattern of differentiated development in all regions [4], and make due contributions to farmers' prosperity and rural revitalization.

### **6.2. The Development of Characteristic Agriculture Should Carry Out Unified Industrial Planning**

Whether we develop one quality in one county, one quality in one township, or one quality in one village, it is necessary for the government to carry out unified industrial planning, according to market needs, guide counties, townships and villages to determine their own characteristics of the same or different characteristic varieties, and reasonable layout of agricultural industrialization, modernization development base, on this basis to guide the second and third industries and planting industry combination, improve and expand the industrial chain, the formation of regional competitiveness. Donggang City takes the approach of "government-led, enterprise participation and market operation", and successfully creates a characteristic industry of "one county and one product", and develops the current scale of the whole industrial chain of 10 billion yuan. In view of the relatively dispersed situation of agricultural and rural development in China, it is completely necessary to promote the establishment and modernization of local agriculture under the guidance of unified government planning.

### **6.3. The Development of Agriculture with Special Characteristics Requires Strong Scientific and Technological Support**

Science and technology is a necessary condition for agricultural modernization. For example, industries featuring grain, cotton and other bulk agricultural products need scientific and technological innovation support in improved varieties, green organic production and mechanized planting and harvesting. Agriculture with refined products in vegetables and fruits needs to be supported by scientific and technological innovation in terms of ensuring the special and excellent varieties, innovation in planting methods, and research and development of deep processing, otherwise it is difficult to obtain long-term market competitiveness. Donggang establishes the exclusive national strawberry research and development institution (Liaoning Strawberry Science and Technology Research Institute), establishes the strawberry seedling virus-free tissue culture center and strawberry germplasm resource nursery, regularly carries out technical training for strawberry industry practitioners, promotes the efficient production technology invented in practice, and makes good use of the Internet and information technology. Only by promoting the upgrading of varieties, planting methods and sales models can the agricultural and sideline industries, which is an experience worth learning from.

### **6.4. The Development of Characteristic Agriculture Requires Advanced Forms of Production Organization**

The current production mode of "farmer", "cooperative + farmer", "cooperative + base + farmer" and "enterprise + farmer + base" in Donggang strawberry industry has overcome the limitations of smallholder production to a certain extent, but there is still a gap between the leading enterprises and a more market-oriented and information-based agricultural modernization model. To develop specialized agriculture, all regions need to vigorously develop new models of intensive land utilization and comprehensive development of primary, secondary and tertiary industries, such as "company + cooperative + base", "company + village collective + base", "company + base + service", and so on. Village collectives and farmers buy

shares in enterprises with land, and original farmers and people attracted from cities become employees of enterprises. According to the needs of enterprise and industrial development, free flow and free employment in the three industries can form a new pattern of free flow of workers in the first, second and third industries, laying the foundation for changing the urban-rural dual development pattern, so that the development of characteristic agriculture can better promote rural revitalization.

### **6.5. To Develop Agriculture with Special Characteristics, We Need to Increase Investment in Infrastructure**

Due to the wide scope, geographical dispersion and small population density, rural infrastructure construction has the characteristics of high cost and low utilization rate, so the investment in rural infrastructure is generally insufficient, and it is relatively backward compared with urban areas [5]. In order to develop modern characteristic agriculture in rural areas and drive the revitalization of the whole countryside, it is inseparable from the integrated development of the first, second and third industries of "agriculture + processing industry + leisure tourism". Among them, the modern agricultural planting mode of the park requires a high level of agricultural infrastructure (such as water conservancy, irrigation, etc.), the development of rural local agricultural products deep processing industry and leisure tourism, cultural experience, health care, elderly care, rural e-commerce and other new forms of business, but also needs a higher level of transportation, information and other infrastructure. Improving production and living facilities in rural areas, providing better public services such as education and medical care, and narrowing the gap between urban and rural areas can better attract talents and attract business investment. All these are inseparable from the government to strengthen the investment in rural infrastructure, improve the basic social functions of the new countryside.

### **6.6. The Development of Characteristic Agriculture Requires Efficient Policy Support**

Local governments at all levels are required to carry out efficient policy support and guidance in order to develop and promote the industrialization and modernization of characteristic agriculture, relying only on rural areas and farmers to spontaneously find projects and compete for markets. Donggang develops the strawberry industry, makes use of the existing relevant national policies, and strives for the central financial award and subsidy funds for industrial development, scientific and technological innovation, talent training and other experiences, which is worth learning and reference. In addition, local governments, especially city and county governments, should study local specific policies for the development of the whole agricultural industry chain with local characteristics, such as financial support policies, land use transfer policies, leading enterprise development support policies, and preferential policies for social capital investment in agriculture and rural areas. It is also necessary to give necessary policy support in innovating agricultural development insurance types, developing order agriculture, futures agriculture, etc., and form a perfect and efficient policy system to support the development of characteristic industries.

## **Acknowledgments**

This work is supported by the National Innovation and Entrepreneurship Program for Undergraduates, "Research on the Dilemma and Path Optimization of Characteristic Agriculture Development from the Perspective of Rural Revitalization: Based on the Analysis of Donggang Strawberry Industry" (Grant No: 202110378225).

## References

- [1] Sun Chengyan, Li Zhu, Gu Jun. Development History of Strawberry Industry in Donggang City, the First strawberry County in China [M]. Beijing: China Agricultural Science and Technology Press, 2021:11+25+52-54.
- [2] Miao Baofeng, Cai Xiaohua. Donggang strawberry "red" all over the river [N]. Liaoning Daily, 2019-12-30(01).
- [3] Fan Minqiang, Fan Yongping. Consideration on the development of rural characteristic industries from the perspective of rural revitalization: Based on a typical survey of tea industry development in Rucheng County [J]. Journal of Hunan Institute of Administration, 2019(01):72-77.
- [4] Research on the development model of new rural characteristic industry -- Based on the empirical investigation of "Flower Capital" in Chencun, Foshan City, Guangdong Province [J]. Rural Economy and Science and Technology, 2016, 27(05):196-198+171.
- [5] Zheng Zhaobing, Zheng Qiliang. Strategies for the development of rural characteristic industries based on the perspective of rural revitalization [J]. Rural Economics and Science and Technology, 2019, 32(24):178-180.