Research on the Strategy of Intelligent Agriculture to Promote Rural Revitalization

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Abstract

Rural revitalization is an important issue in the development of China in recent years. How to improve agricultural competitiveness and sustainable development capacity is the core issue of implementing rural revitalization strategy. Based on the development status of Intelligent Agriculture, combined with the development of foreign Intelligent Agriculture, this paper uses statistical analysis, comparative analysis and other methods to propose different implementation paths for the development of Intelligent Agriculture in China according to regional characteristics. The purpose of this article is to provide impetus for Rural Revitalization in China.

Keywords

1. INTRODUCTION

In recent years, the research on Intelligent Agriculture in China is emerging with the upsurge of scientific and technological innovation. The integration of agricultural production and new technologies such as Internet of things, big data, artificial intelligence and so on is also developing rapidly, which is constantly changing our production and life style. The development of Intelligent Agriculture not only accelerates the process of agricultural modernization, but also plays an important role in the implementation of Rural Revitalization Strategy.

2. COMPOSITION AND RELATED CONTENTS OF INTELLIGENT AGRICULTURE

What is Intelligent Agriculture? It is the combination of the Internet and agriculture, applying high and new technology to traditional agriculture, and using sensors and software to control agricultural production through mobile platform or computer platform [1]. It has a wide range of applications, including intelligent agriculture production, intelligent agriculture management, intelligent agriculture services and intelligent agriculture security traceability.

First, intelligent agriculture production mainly uses big data, Internet of things, sensor technology and other functions to realize the visualization, remote control, disaster warning and other functions of modern agricultural production, which enhances the anti risk ability of agriculture [2]. Meanwhile intelligent agriculture production adds the environmental factors of agricultural production.

Second, intelligent agriculture management makes full use of the Internet to establish a rural e-commerce platform, land transfer platform, agricultural information platform, etc., and uses modern technology and methods to organize agricultural production and operation, so as to make information communication more convenient, which is of great significance to the adjustment of agricultural economic structure and the development of rural economy. At the same time, it can also solve the problems of scattered agricultural planting and asymmetric

information of market in China, which plays an important role in improving the quality of agricultural products and optimizing the structure of agricultural industry.

Third, intelligent agriculture services mainly relies on the Internet to provide all kinds of service information and related platforms. Such service information not only helps farmers to obtain external information, but also teaches farmers new knowledge and skills through distance education, so as to promote the good development of rural agricultural production and eliminate the important way of information asymmetry.

Fourthly, intelligent agriculture security traceability system can supervise the whole circulation process of agricultural products, which can not only improve the quality of food, but also reduce the probability of food safety problems.

3. DEVELOPMENT STATUS OF INTELLIGENT AGRICULTURE

3.1. The Development of Intelligent Agriculture Presents Regional Characteristics

The development of Intelligent Agriculture has a certain relationship with the local economic development, as well as with the local geographical environment. Therefore, it shows regional characteristics. Taking Shandong Province as an example, There are great differences in the development of Intelligent Agriculture in the whole agricultural science and technology park in shandong province. For example, there are many achievements in linyi, weifang, jining, heze, yantai, dezhou, jinan, binzhou and so on. The specific innovation and achievement transformation are shown in Table 1:

Table 1. The transformation capacity of agricultural science and Technology Parks in Shandong Province

City	Result number	Proportion (%)	Patent number	Proportion (%)	Total	Proportion (%)
Linyi	547	21.43417	1696	21.60785	2397	18.52109
Taian	182	7.131661	1947	24.80571	2280	17.61706
Jining	632	24.76489	712	9.071219	1640	12.67192
Dezhou	243	9.521944	1086	13.83616	1412	10.91021
Weifang	91	3.565831	725	9.236845	960	7.41771
Jinan	277	10.85423	430	5.478405	834	6.444135
Qingdao	17	0.666144	3	0.038221	786	6.07325
Heze	59	2.311912	461	5.87336	697	5.385566
Yantai	115	4.50627	225	2.866607	480	3.708855
Zibo	124	4.858934	145	1.847369	349	2.696647
Dongying	45	1.763323	93	1.184864	291	2.248493
Liaocheng	61	2.390282	63	0.80265	208	1.60717
Binzhou	23	0.901254	92	1.172124	205	1.58399
Weihai	67	2.625392	119	1.516117	191	1.475815
Rizhao	57	2.233542	20	0.25481	130	1.004482
Zaozhuang	12	0.470219	32	0.407695	82	0.633596
Total	2552	100	7849	100	12942	100

Through the sorting of the above table, we can see that Linyi, Tai'an and Jining are at the forefront of the transformation capacity of achievements, while the overall situation of Weihai,

Zaozhuang and Rizhao is relatively weak. In the development of agricultural science and technology parks in Shandong Province, Linyi accounts for 18.52% of the total innovation, while Zaozhuang is less than 1% and Rizhao is just 1%. Zaozhuang and Rizhao both border on Linyi, but the development gap of modern agricultural science and technology parks is so large, which shows that there are still some problems in playing the leading role. In other words, it must be combined with the actual situation of its own region to better realize the sustainable and high-quality development of local agricultural modernization.

3.2. Analysis on the Development Mode of Intelligent Agriculture

The development mode of intelligent agriculture mainly includes four aspects: first, the application of Internet of things technology is regarded as the key element to promote the Intelligent Agriculture production. The combination of agriculture and Internet of things technology refers to the application of Internet of things, mobile Internet, 3S and other technologies, as the production mode of modern information technology innovation in agriculture [3]. The application of Internet of things, monitoring data and analysis results can be transmitted to the monitoring center in time to achieve real-time accurate monitoring of agriculture. Secondly, we need focus on the development of E-commerce Internet business. The e-commerce of agricultural management can promote the development of agricultural industry characteristics. The e-commerce management mode can promote the quality of agricultural products, and realize the circulation and profit of agricultural products. Thirdly, the application of big data technology is the foundation of the development of Intelligent Agriculture. Big data technology is the key to the development and application of agricultural big data. Its purpose is to collect and supervise production information, to conduct scientific analysis on production process and quality, and to provide personalized services through the construction of a comprehensive Intelligent Agriculture information service platform. Finally, we should establish a new information service system of Intelligent Agriculture service. The establishment of innovative service system can enhance the comprehensive system construction of grass-roots agriculture, and strengthen the informatization level of public welfare services in various agricultural production activities.

3.3. Analysis of Market Scale and Supply and Demand of Intelligent Agriculture

Modern agriculture has quietly entered the era of Internet of things, and the overall situation of intelligent agriculture is emerging. In 2020, the potential market size of China's Intelligent Agriculture is expected to grow from US $13.7 billion in 2015 to US $26.8 billion, with a compound annual growth rate of 14.3%. The specific data is shown in Figure 1.

Figure 1. Growth trend of potential market size of China's Intelligent Agriculture in 2015-2020

At present, the Internet+ agriculture is the main form of the intelligent agriculture, and there are many channels of sale in the circulation of intelligent agriculture, such as B2B, B2C, etc., and the Internet+ agricultural industry report indicates that the value of the Intelligent Agriculture market is over 1 billion RMB. Among them, the agricultural material industry is more than 2 trillion RMB, and the trade of agricultural products has exceeded 5 trillion RMB. Intelligent Agriculture has rich development potential, but at the source, the development foundation of our country is quite weak. The construction of Intelligent Agriculture in China is mainly based on the government's public welfare promotion and demonstration, which is led by the government. The projects operated by enterprises often fall into the fixed mode of government investment, enterprise development and government procurement services. The cost of equipment purchase and data maintenance is high. How to commercialize and rapidly promote the operation of Intelligent Agriculture has become a problem in China. Thirdly, the operation and maintenance of Intelligent Agriculture requires high cultural level and knowledge structure of practitioners, which often requires the operation of professional teams. How to strengthen the cultivation of professional farmers' teams is also an urgent problem.

4. FOREIGN EXPERIENCE OF INTELLIGENT AGRICULTURE

4.1. America

In 2017, the United States is the world's largest food export country, accounting for 34%, relying on its 2.84 million agricultural employees, who account for less than 1% of the total population. As early as the 1940s, the United States has basically realized the mechanization of agricultural production in the field of agriculture. At the same time, the United States first developed the knowledge of computer technology expert system in agriculture. Since the 1990s, the U.S. government has allocated more than $1 billion annually for agricultural data network construction, technology promotion and online application. American farm workers can complete fine operations through a series of technologies such as global positioning system, farmland remote sensing monitoring system, farmland geographic information system, agricultural expert information system, Intelligent Agriculture machinery system, environmental monitoring system, system integration, network management system and training system.

4.2. Germany

Based on the basic concept of "industry 4.0", Germany develops digital agriculture as the development direction of its own Intelligent Agriculture. Germany's Intelligent Agriculture combines big data and cloud technology. It transfers the climate, soil, moisture, humidity, temperature, geographical location and relevants data of each field to the cloud, analyzes through the cloud platform. Then, it automatically transfers the processed data to intelligent large agricultural machinery, and commands them to start fine operations. In addition, large-scale agricultural machinery achieves fine job control through the global positioning system (GPS) navigation system. The error range can be controlled within a few centimeters.

4.3. Britain

With the strong support of industrial technology and scientific research and education, the government attaches great importance to British agriculture, and the development of precision agriculture technology, Britain has become one of the advanced agricultural technology developed countries. It is understood that 17% of British farms have implemented precision agriculture technology. Relying on GPS positioning technology, it ensures the accuracy of sowing, pulling grass, fertilizing, spraying medicine and harvesting. It ensures the accurate operation and variable rate fertilization and spraying medicine through the data on Soil and crop nutrition provided by remote sensing image. Through the application of field traffic management system,

it makes the error of the route track of inter field agricultural machinery in operation controlled within 2.5cm, reducing the field knot caused by agricultural machinery Destruction of structure, saving resources and improving efficiency.

4.4. Israel

Israel's contribution rate of agricultural science and technology is higher than 90%, ranking the top in the world. The government spends as much as $100 million a year on agricultural research, which accounts for 3% of agricultural output value. Science and technology have promoted the development of agriculture. Agricultural income is first used in agricultural scientific research. At the same time, the government is also actively promoting new technologies. From seed-selecting to seedling, planting, irrigation, fertilization, harvesting, processing, storage, greenhouse, packaging and other processes, we try our best to seek the best income, and develop them into a highly specialized and technology intensive industry.

5. THE IMPLEMENTATION PATH UNDER THE REGIONAL SUBDIVISION OF INTELLIGENT AGRICULTURE IN CHINA

According to the characteristics of agricultural development in different regions of China, different implementation paths of Intelligent Agriculture will conveniently be formulated according to their own regional characteristics. The frame is shown in Figure 2:
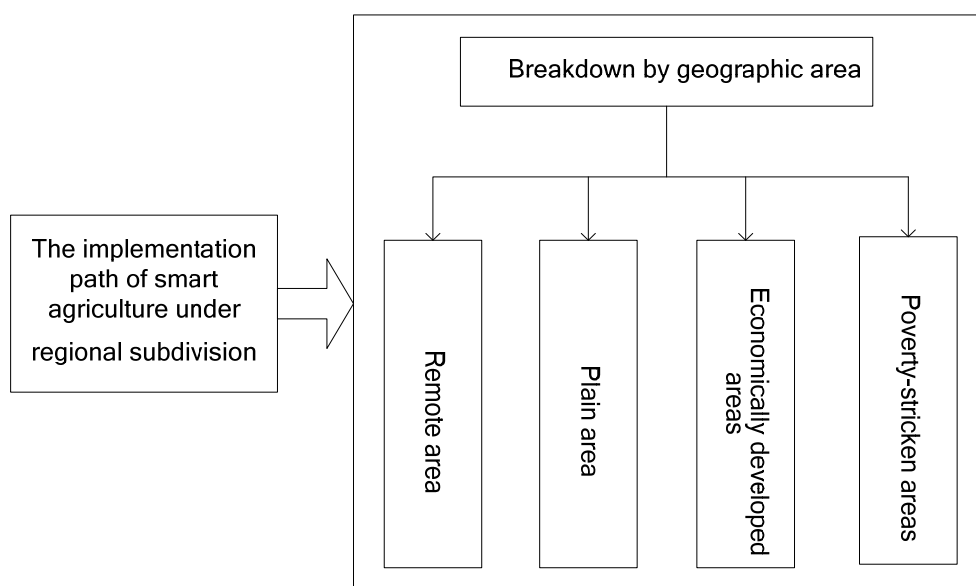

Figure 2. Agricultural regional segmentation framework

5.1. Strengthening the Deep Integration of Informatization and Rural Business Innovation in Remote Areas

As the transportation is inconvenient in remote areas, the best choice is to adopt e-commerce platform, which promotes the deep integration of informatization and rural business innovation, and make a new breakthrough in service mode. With the wide application of Internet technologies, such as "Internet+", it is a common that farmers sell vegetables online and people buy vegetables online in rural areas. With the development of information, agricultural products in the deep mountains are sold all over the country [4]. We should speed up the construction of advantageous agricultural products regions in poverty-stricken areas. Taking the opportunity of comprehensive cooperation with major e-commerce platforms, we should vigorously develop e-commerce, and innovate online marketing. Meanwhile, the government should support enterprises to carry out cross-border e-commerce transactions of agricultural

products, and promote the development of import and export trade of agricultural products. In addition, we should enhance the capacity of premium income increase of featured agricultural products.

5.2. Promoting the Deep Integration of Informatization and Agricultural Production Development in Plain Areas

Plain area is the main production area of agricultural products. The deep integration of informatization and agricultural production development can promote the application of intelligent agriculture to make new breakthroughs. On the basis of consolidating the application effect, we must comprehensively expand and upgrade the application service level of agricultural informatization. Basing on deepen research, development and innovation in some key applications, we accelerate the construction of agricultural big data center, and deeply promote the application demonstration of Internet of things in agricultural production. Further, we can build the digital agricultural management system, and strengthen the remote sensing technology in the monitoring of soil moisture and seedling disaster Application. In addition, we promote the demonstration and promotion of Agricultural Internet of things technology, and promote the realization of precise management and full automatic control of crop planting, livestock and poultry aquaculture.

5.3. Strengthen the Integration of Information and Agricultural Product Quality and Safety Supervision in the Developed Areas

In the developed areas, the requirements for food security are higher. At present, China has actively explored the quality and safety supervision of livestock products, but it has not yet achieved intelligent supervision in other agricultural products. In order to guarantee the "safety on the tip of the tongue" of the people, we should control the whole process of "from farmland to dining table", which the people not only "eat well", but also "eat safely, healthly and nutritiously". It can not be separated from the comprehensive application of information technology in the supervision of agricultural product quality and safety [5]. Therefore, we should make every effort to promote the strategy of developing agriculture with quality, green and brand, strengthen the dynamic collection. We should analysis and monitoring of agricultural input information, and promote the construction of quality and safety traceability system that monitors the whole process of agricultural product quality from the field to the market terminal. Finally, we constantly strengthen the quality and safety supervision capacity of agricultural products, and ensure the safety and stability of agricultural product supply.

5.4. Strengthen the Integration of Informatization and Technical Training in Poor Areas

The education level of poor areas is poor, but the construction of intelligent agriculture can not be separated from the agricultural talent team. In today's intelligent terminal everywhere, information-based training for farmers is the basic condition for farmers to integrate into the information society. A small mobile phone contains unlimited information. Only the farmers who have learned to use smart terminals skillfully can master the access to information, which is to make information flow and greatly change life style in rural areas. We will continue to fully implement the project of information access to villages and households, and train farmers in mobile phone application skills and e-commerce. Meanwhile, we cultivate a group of new professional farmers who are good at using information technology and network management.

6. CONCLUSION

In the process of agricultural development, intelligent agriculture is an important development trend, which can provide strong support and guarantee for modern agriculture. However, we should also note that problems are very easy to occur in the development process

of Intelligent Agriculture, so we must develop and innovate keep with the times, and then realize the smooth transformation to traditional agriculture. We constantly improve the level of agricultural upgrading, that will bring new opportunities for rural development, therefore, we can achieve the goal of rural comprehensive revitalization and development in the new era. Intelligent Agriculture will become the realization of Rural Revitalization and development Important path of exhibition strategy.

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