Coordinated development of agricultural economy and rural tourism based on big data

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Abstract. In China's national economic system, the agricultural economy is an important component. Regardless of the development model, development direction and scale of the agricultural economy, it will have an important impact on the development and progress of the national economy. As the country attaches great importance to agricultural development, the reform of agricultural development is gradually being deepened. The application of big data can effectively analyze the agricultural economy and rural tourism market information, which is conducive to promoting the coordinated development of the two. At the same time, China has put forward a strategy of "village revitalization", which brings new development opportunities for agricultural economy and rural tourism. Based on this, this article first analyzes the connotation and characteristics of big data, then introduces the development of agricultural economy and rural tourism under big data, and finally discusses the strategy of combining the two to improve the overall quality of rural economic development.

1 Introduction

As a country with a large population, agriculture plays an important supporting role for the stability of China's society [1], and is the foundation of national economic development. This is determined by China's basic national conditions and national development strategy. Therefore, the development of the agricultural economy is related to the stability of the society and the overall progress of the national economy [2]. Agriculture in China has been regarded as the basic guarantee for the healthy development of the country since ancient times. Xu Hui [3] believes that with the rapid development of my country's economy and the continuous improvement of people's living standards, agriculture has become more and more important in the development of the national economy. With the advancement of network technology, the use of big data has become more and more widespread. Governments, enterprises and individuals are all beneficiaries of big data, which has changed the traditional methods of information dissemination and data processing. How to use this technology to promote the development of agricultural economy and rural tourism in the context of big data is an important issue for the development of socialist rural economy with Chinese characteristics in the new era. Only by realizing the interconnection of agricultural economy and rural tourism information, can we fully mine various data, promote the effective adjustment of economic structure, the precise marketing of rural tourism, and accelerate the transformation of rural economy and rural tourism, so as to ensure the coordinated development of the two, and then improve the quality of rural economic development [4]. China is currently in a critical period of economic transformation. Making good use of big data to promote the coordinated development of agricultural economy and rural tourism has become a brand new concept, which will surely play a powerful role in agricultural production and related economic development. The logical framework of this article is shown in Figure 1.
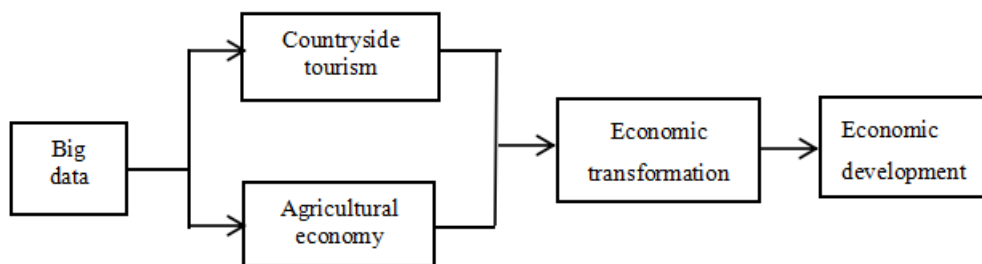

Fig 1. The logical framework

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2 Big data technology

Big data is a collection of data, which greatly exceeds traditional database software tools in terms of acquisition, storage, and management, and has stronger capabilities [5]. As early as the 1980s, scholars predicted the arrival of the era of big data. By 2007, relevant American research institutions believed that modern society had entered a period of data exploration. Big data analysis is closely related to cloud computing, can effectively process large amounts of data, and is of great significance to social development. Big data can analyze effective information and create more value for mankind. With big data technology, governments and enterprises can provide more accurate products or services to the masses and consumers, and transform the data utilization situation of the entire society. In the future, the degree of resource utilization of big data will be higher and higher, and it will be deeply integrated with cloud computing technology, and its data management will become the core competitiveness [6].

3 Problems in China's current agricultural construction

3.1 The agricultural economic management system is not sound

At present, China implements a socialist market economy system, but the current agricultural economic management system has great planned economy characteristics. For example, in the modernization of agriculture, China adopts a quota system for the cultivation of grain and other related agricultural products in different regions. As a result, the current agricultural economic management system cannot integrate well with the market economy. Research shows that since 2005, China's annual rural work conferences have repeatedly proposed to improve the relevant agricultural economic management system and adhere to a modern management model [7]. This shows that the current China's agricultural economic management model and related system construction have lagged behind agricultural development and can no longer meet the requirements of China's current agricultural development. Unreasonable agricultural economic management has largely affected the healthy development of China's agricultural economy.

3.2 Backward agricultural economic management concepts

Cao Fei[8] pointed out that although China has already put forward the relevant concepts of agricultural economic management and has begun to promote it in agricultural modernization, statistical results show that China's agricultural information management level is still at a relatively backward level in agricultural modernization. The main reason lies in the backwardness of the agricultural economic management concepts of the majority of grassroots workers, and they did not realize the role of agricultural economic management in promoting agricultural modernization. For example, the quality of agricultural products, technical issues in agricultural production, deep processing of agricultural products, and sales issues are all restricted by the backward concepts of agricultural economic management. Therefore, changing the concept of agricultural economic management and the level of agricultural economic management is an urgent problem that needs to be solved to improve the current agricultural modernization.

3.3 Unbalanced agricultural economic management

In the development of traditional Chinese agriculture, in the past, it only paid attention to the increase of the quantity of agricultural products such as grain, while neglecting the improvement of the quality of agricultural products for a long time. Under the guidance of this erroneous concept, China has long focused on agricultural output. Although this approach has solved the problem of food shortages to a certain extent, as people's living standards and quality of life continue to improve, this erroneous concept leads to the blind pursuit of agricultural production and the large-scale use of chemical fertilizers and pesticides. The unreasonable use of a large number of chemical fertilizers and pesticides has increased the output of agricultural products and has also caused serious damage to the local soil ecology and water environment. Due to the large-scale use of pesticides, the pesticide residues on relevant agricultural products have exceeded the standard. This phenomenon has caused the prices of relevant agricultural products in China to be lower than the international average prices, which directly affects the income of farmers, as shown in Table 1. And because of excessive pursuit of quantity increase in agricultural production, excessive introduction of foreign high-yield varieties, excessive use of pesticides and fertilizers, etc., the ecological environment of the region has been damaged.

Table1. Farmers' income in different countries

Species	China's average return	U.S. average return
Wheat	600	800
Corn	450	780
Soybeans	1000	1350

3.4 Weak economic management information

With the continuous advancement of science and technology, information technology has gradually penetrated into all aspects of people's lives, which not only greatly improves work efficiency, but also greatly reduces workload. In the development process of agricultural modernization, agricultural informatization has played an increasingly significant role in promoting agricultural modernization. The level of informatization of agricultural economic management, which is the direction of agricultural modernization, directly affects the process

of agricultural modernization. Based on this, the current agricultural economic management is also gradually developing in the direction of informationization [9]. At present, the highest level of informatization of agricultural economic management in the United States is about 76.5%, followed by about 72.4% in Germany, while the informatization of agricultural economic management in China is only 23.5%, much lower than other countries, as shown in Figure 2. In the information society, the speed and amount of information acquisition are crucial to the competitiveness of enterprises. Therefore, the level of informationization of agricultural economic management has an important impact on the agricultural development of different countries and the economic interests of related agricultural enterprises and individuals. The backwardness of information technology will to a large extent lead to the asymmetry of information in agricultural production, and the asymmetry of information in economic activities will eventually seriously affect agricultural development [10].

Table2. The degree of agricultural informatization in different countries

Country	The degree of agricultural management information
England	63.1%
Netherlands	57.8%
America	76.5%
China	23.5%
Japan	68.4%
New Zealand	48.6%
German	72.4%

4 The necessity of rural tourism construction

From 2015 to 2019, the economic revenue of China's tourism industry accounted for the increase in total revenue year by year, as shown in Table 3. From the perspective of rural tourism development itself, the development time of rural tourism is short, and the development forms of various regions are different. At the same time, most of the tourism resources are located in the vast rural areas. the level of regional economic development and geographical location conditions determine the insufficient development of its tourism infrastructure, and the overall level and quality of tourism services need to be improved. At present, cloud data technology can achieve comprehensive information screening of tourists. Through comprehensive comparison and analysis of various information such as tourists' information and consumption ability, it can provide a reference for the innovative design of rural tourism products and service supply. And through the analysis of such information, the tourists are classified into groups, guide and predict the decision of tourists, and transmit and share data through the information platform, connect tourism management entities and tourism operation entities, and formulate tourist consumer psychology marketing strategy.

Table3. China's tourism revenue as a percentage of total revenue

Year	Percentage
2015	4.51%
2016	6.62%
2017	7.11%
2018	10.54%
2019	15.36%

5 The Coordinated Development Strategy of Agricultural Economy and Rural Tourism

5.1 Strengthen the transformation and upgrading of rural industries

Agricultural economy is the foundation of the development of rural tourism. Traditional rural tourism is subject to seasonal and spatial restrictions, coupled with the high repeatability of rural tourism landscapes, which reduces the tourist attraction to a certain extent. The development of green ecological agriculture under the background of big data must start with production, processing, and sales, and combine green agriculture with modern tourism. It is necessary to develop the agricultural economy, protect the local agricultural ecosystem, and promote the green and sustainable development of agriculture. At the same time, reduce environmental pollution, form a characteristic agricultural economic industrial chain, stimulate the vitality of agricultural economic development, and enhance the attractiveness of the agricultural economy to tourists.

5.2 Pay attention to the promotion of rural tourism culture

Rural tourism meets the spiritual needs of contemporary consumers. The creation of green ecological rural tourism with the support of big data can help tourists experience the joy of agricultural production, so that they can better return to nature and respect nature. For example, when developing agricultural tourism resources, it is necessary to use big data to analyze the carrying capacity of the local environment to ensure scientific and appropriate development and improve the sustainable development of rural tourism resources. At the same time, it is necessary to focus on the construction of cultural brands, lengthen the industrial chain of rural tourism economy, combine agricultural economy, agricultural production and rural tourism, and gradually form cultural brands to win the recognition of tourists.

5.3 Strengthen the construction of big data service platform

Agricultural production is seasonal, and the peak season of rural tourism is often consistent with the time of agricultural production. This limits the development of rural tourism to a certain extent and cannot bring more economic income to rural tourism. Therefore, it is

necessary to strengthen the construction of big data service platforms. First, it is necessary to form a database of agricultural economy and rural tourism data, analyze effective information through cloud computing, increase government investment in the construction of big data platforms, and establish rural information service centers. Second, it is necessary to strengthen cooperation with enterprises to promote cloud tourism and rural tourism. The combination of rural tourism will promote the development of sightseeing agriculture, break the seasonal restrictions on rural tourism, and expand the market attractiveness of rural tourism. Finally, it is necessary to use the big data service platform to optimize the rural medical, health, transportation, and education environment, and provide supporting services for rural tourism, so as to expand the agricultural economy and rural tourism market and achieve the coordinated development of the two.

6 Conclusion

China's agricultural construction is facing many difficulties. In order to achieve the coordinated development of agricultural economy and rural tourism under the background of big data, it is necessary to strengthen the transformation and upgrading of rural industries, find a path suitable for agricultural development in the region, and enhance the characteristics of rural tourism resources. At the same time, the development of agricultural economy and tourism is inseparable from big data technology. Only by realizing the interconnection of agricultural economy and rural tourism information can the transformation of economy and tourism be accelerated to ensure the coordinated development of the two, thereby improving the quality of rural economic development. China is currently in a critical period of economic transformation, and making good use of big data will surely play a powerful role in agricultural production and related economic development.

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