Analysis of the status quo and trend of agricultural economic management under the background of big data

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Abstract: With the global economic network, the collection and processing of big data information data is more and more important, and the development trend of big data makes appropriate adjustments and choices in the management of agricultural economy. The use of big data in the combination of agricultural economic management environment has increased the information value of agricultural economic management. On the basis of science, big data as a development economic forecast not only provides a powerful guiding role for agricultural production, but also provides an effective basis for the management and decision-making of agricultural production. Based on the analysis of the development status of big data agricultural economic management, this paper provides a new direction for the innovation and development of China's agricultural economic management.

1. Introduction

For the research on the development of big data agriculture, many experts and scholars have analyzed and discussed this aspect. For example: 2018 [1] Zhao Bing... et al. Research on the progress of key technologies for agricultural big data: 2018 [2] Gu Geqi and Li Wei. Discussion on the construction system based on crowdsourcing agricultural big data collection platform; 2017 [3] Wenyuan is based on the design system application of Hadoop agricultural big data management platform; 2017 [4] Zheng Xi studied the effective use of agricultural big data; 2016 [5] Li Ling-ping. etc. Analysis and discussion on the application of agricultural big data at home and abroad; 2016 [6] Wang Wen-sheng and Guo Lei-feng. Design of the analysis of the construction system of China's agricultural big data center; 2015 [7] Xi Xiao-jian will analyze and explore the agricultural big data construction system; 2015 [8] Sun Xiao-yong...etc. The application and development of big data in the field of agricultural research; 2015[9] Chen Xiao-fang... et al. The implications of the development of European agricultural cooperatives for Chinese agriculture and the analysis of Denmark in Northern Europe; 2014 [10] Chen Feng-bo developed from the American Agribusiness discipline as a reference for the development of China's agricultural economics discipline; 2014 [11] Wang Jun inspired the development of Chinese agriculture with new developments in North American agricultural cooperatives; 2014 [12] Zhang Ni...et al. discuss research and analysis of big data security technologies and applications. The above can be found that the development of big data agriculture has a lot to do in China, the application and development of systematic big data in the
field of agricultural research.

2. The concept of big data
With the development of the global economic network, the tremendous big data is gradually replacing the traditional data analysis to complete the data analysis technology. Apply advanced technology analysis to big data generated by current agricultural production and management activities has generated tremendous impetus to the agricultural field. A wide range of agricultural big data sources are combined with their own characteristics to produce complex and diverse structural types with potential value and difficult to use conventional single technology to process and analysis data set. Agricultural big data is widely distributed in all aspects from farmland sowing to agricultural product processing and sales, and animal husbandry production. It not only retains the basic features of large-scale, multiple types, fast processing, high precision and complexity of big data itself but also extends and deepens the information flow of interaction within agriculture.

2.1 Agricultural big data and its characteristics
The big data of agriculture is composed by agricultural resource data related to agricultural production and operation, agricultural means of production data, agricultural technology database, agricultural product market information data, Agricultural policy regulation data and agricultural institution. However, the agricultural production operation environment is affected by factors such as climate, soil and crops that make the relevant data form multi-dimensional, dynamic, uncertain, incomplete and other characteristics. So it has important value in the field of agricultural big data and its value density is inversely proportional to the amount of data. A single piece of data doesn't have much value but when the accumulation of data is abundant, it hides rich wealth.

2.2 Large amount of data and diverse types
Domestic agricultural big data not only has regional data, but also draw lessons from foreign information data containing industries such as planting, aquaculture and forestry. Simultaneously, Extended to seeds, fertilizers, pesticides, agricultural machinery, feed, agro-processing and other agricultural affiliated Sub-industries all information data. Also includes all kinds of statistical data, import and export data, price data, production data and weather data, etc.

Therefore, the type of agricultural big data involves not only land, meteorological, biological, water and other resource data but also planting data of seedlings, cultivated land, water conservancy, agricultural machinery, and livestock data for piglets, feed, outbreaks, etc. It also include market supply and demand and market data from domestic production data to international agricultural product dynamic data.

2.3 Emphasize real-time analysis, Fast handling with high accuracy
In addition to conventional data collection and artificial submitted, also applied GPS to quickly locate itself and generate location information. Coupled with the use of GIS, whether it is the establishment of agricultural information resources, dynamic monitoring of agricultural resources, or management and decision-making of agricultural production can be completed quickly. Information map of agricultural resources, agricultural disasters, and crop growth can be generated by remote sensing imaging technology. Agricultural big data use scientific collection method to analyzed and mined accurately, which has high accuracy.

The large amount of data, the diversification of data types, the rapid processing and the high accuracy show that the processing and analysis of large agricultural data is difficult and complex. It plays an important role in promoting the whole agricultural production operation activities and the development of agricultural-related enterprises, which shows that agriculture is an important application field for big data.
2.4 Current Situation of Agricultural Economic Management in Colleges and Universities

A large number of universities setting up agricultural economic management disciplines in China which mainly divided into three levels: college, department and specialty. Agricultural and forestry economic management, as a first-level discipline, in Chinese universities falls within the scope of management and agronomy which covering all kinds of disciplines on agricultural economic management and including agricultural economics, rural regional development, agricultural (forestry) business management. As a big agricultural country, China has continuously improved and perfected the discipline settings of agricultural and forestry economic management. According to survey data, a total of 196 universities in China have set up master's degree programs in management, of which 63 have set up related disciplines in agricultural economic management, such as agricultural economics, rural regional development, agricultural resources and environmental economics, forestry economic management, agricultural water conservancy engineering, etc. The number of set up related disciplines in agricultural economic management university accounts for more than 30%, obviously reflect that the management research of colleges and universities in China put a high value on the management of agricultural economy. (Table 1)

Entering the 21st century, the issue of agriculture, countryside and farmers has attracted great attention in China. Therefore, it has become the research focus of the discipline. In the future, we should further expand the scope of research, truly reflect the practical problems of agriculture, rural areas and farmers, strengthen applied research, accelerate the transformation of scientific research into practice, and make agricultural economic management research better serve China's agricultural development.

Table 1. The establishment of agricultural economic management disciplines in Chinese universities

| Subject name                                              | Number of universities |
|-----------------------------------------------------------|------------------------|
| management                                                | 192                    |
| Applied Economics                                         | 56                     |
| Sociology                                                 | 9                      |
| Agricultural Economic Management                          | 59                     |
| Agricultural Resources and Environmental Economics         | 6                      |
| Agricultural Economics and Business                       | 3                      |
| Agriculture and Forestry Economic Management              | 10                     |
| Agricultural Economy and Rural Sociology                  | 1                      |
| Agriculture and Consumer Economics                        | 3                      |

3. China's Agriculture Correctly Deals with Opportunities and Challenges of Economic Globalization

With the advent of the era of economic globalization, the political and economic ties between countries all over the world have become closer, resulting in increasingly fierce competition in the international market for agricultural products. And transnational international agricultural products processing, circulation, trade and other fields have strong competitiveness. Forming a monopoly advantage and pattern, which poses a threat to China's agricultural production, export and agricultural security. With the rising cost of domestic agricultural products and the prices of international agricultural products continuous decline, the space for Chinese agricultural products is getting smaller and smaller. Moreover, due to WTO restrictions on yellow box subsidies, the domestic government's grain subsidies, fertilizer subsidies, and pesticide subsidies will be reduced accordingly, which will inevitably lead to a chain reaction, farmers' production enthusiasm will be inhibited, and agricultural production enterprises will also be affected. In addition, in recent years, the Belt and Road Initiative policy has signed free trade agreements with a number of countries, and the domestic agricultural product market has been further opened. The influx of high-quality and inexpensive agricultural products abroad has also caused a huge impact on domestic agricultural products.

Overall, the domestic and international development of China's agriculture is not optimistic. How
to overcome the adverse effects of economic globalization on China's agricultural development, we should actively meet the challenges, carry out scientific planning for China's agricultural development, and enhance international competitiveness, which is a realistic problem to be urgently answered by the discipline of agricultural economic management. Firstly, we should actively promote the integration of the original decentralized small-scale farmers' production mode with the optimal timing of global production system control. We should rigorously promote the development of agricultural scale, intensive and industrialization, support the healthy development of agricultural economic organizations, and strengthen the anti-risk ability of the main body of the market itself. Secondly, China has abundant agricultural population and vast advantages of agricultural product consumption market. Therefore, we should seize the opportunity of resource optimization brought about by globalization and give full play to the advantages of domestic agricultural labor resources and consumption market.

3.1 Current status of agricultural economic management

In the process of the transition from a traditional agricultural power to a modern agricultural power, China's agricultural economic management has obstacles to development, for instance, the management mechanism is not perfect, the manager lacks agricultural economic awareness, and the related technologies are not in place, etc.

Originally, China had a constantly changing industrial structure of agriculture, however, the development of agriculture keeps pace with the times, and the development of agricultural economy is hampered by the traditional agricultural economic management system. Secondly, in the past, China has not paid enough attention to the management of agricultural economy, and at present stage, it has not formulated and improved the management mechanism of agricultural economy that the agricultural economic management system has not been improved and the original traditional management mode has lost its execution force. The non-synchronous factors between the level and development of agricultural economy lead to the stagnation of the development of agricultural economic management in China.

At present, in order to ensure the sound development of agricultural economic management, relevant departments have successively promulgated relevant documents and regulations, indicating that the state has attached great importance to the development of agricultural economy. However, because local government managers do not attach importance to the development of agricultural economy, they lack the consciousness of agricultural economic management and specific executive power. It indirectly leading to the development results failed to achieve the desired results, and eventually led to frequent problems in the implementation of laws and regulations. On the one hand, the managers ideas are outdated, and they still insist on using traditional agricultural economic management methods. However, their application still shows that they are not mature enough to achieve the modern agricultural economy that cannot keeps pace with the times, and their development cannot achieve the expected management-related effects. On the other hand, most managers lack professional knowledge and practical experience in agricultural production seriously. The specific management work is not professional, and the understanding of agricultural economic development remains on the surface.

3.2 Problems in the development of agricultural big data

At present, although the big data has infiltrated into agricultural life and been applied precisely in some industries, there are still misunderstandings about the big data in agriculture. Many people suspect that big data is over-hyped, big data lacking core value is just a platform for getting more information and storing massive amounts of data. On the contrary, some people over-praise the effect of big data, think that big data can solve all problems, it will completely replace the traditional data analysis and processing methods.

The above extreme understanding is a big misunderstanding. The existence and development of big data is the inevitable result of the progress of information technology. We should make a correct
understanding of the industry as well as make it serve the economy and society better through professional application. Completing large data analysis requires not only computer analysis and processing, but also human guidance and command. There are no mature big data concepts, technologies and methods yet. The incomplete and accurate prediction results of big data only provide a kind of relative reliability for data analysis.

The core work of big data is data mining, and the traditional data processing method cannot meet the demand in the development of big data. According to the characteristics of big data, developing new technology is the key to bring the value of big data into play. With the improvement of computer and Internet technology, we can change the existing data storage and transmission mode to get the greatest benefit in the large data environment.

Big data mining includes four stages: data collection, data storage, data processing, and visualization of results. (pic1)In the process of data collection, it is necessary to collect relevant data on the problems to be solved. With the good development of Internet of Things, Internet and terminal equipment, the ways of data collection have become diversified. High quality data is the premise of accurate analysis results. And it is still a difficult job to distinguish between true and false in a huge database. Although large data allows a small amount of inaccurate data in the data, it does not mean that there is no need to guarantee the quality of the data.

![Fig 1. Stages of four big data mining](image)

The scale of big data storage is getting bigger and bigger, which leads to the continuous updating and challenge of traditional data storage methods. Traditional servers are no longer able to carry large data sets, and general research projects are increasingly difficult to pay for expensive EC2 mask computing cloud services.

The data obtained by different approaches are stored together, before data analysis and processing, the stored data should be cleaned first, but the current technical capacity of cleaning data is not up
to date. In particular, the large number and the complexity of the data structure are the problems that face the processing of data. In the construction of enterprise's whole big data processing platform link, although Hadoop technology can provide related basic system architecture and data management tools such as database and data flow, it is still not enough to solve big data problems. Invalid data is often mixed in a large database, but simple and straightforward data statistics and analysis and processing are difficult to get really valuable content, and even can be used as a wrong conclusion. Therefore, it is important to deal with data management tools such as big data system architecture and database and data flow more effectively.

Visual presentation of data analysis and processing results is intuitively present the result which is through the data analysis. In this session, due to the complexity of large data is enhanced and a large number of unstructured data are included, at the same time, traditional data presentation can only display structured data, it is impossible for the complex unstructured data to present intuitive analysis structure.

Agricultural production safety can be guaranteed by forecasting meteorological information using agricultural big data, but there are hidden dangers in the security of agricultural big data itself. Due to the rich collection channels and the wide range of data, it is inevitable that there will be security on data collection. That is to say, the types of data structures and diversified services are accompanied by the security of data integration and storage. The rich method of collecting data invisibly increases the external presentation rate of data. The requirement of security and privacy protection for data storage and analysis has been raised and traditional protection methods are no longer sufficient for today's needs. The first priority now is to supervise large-scale data. It is worth noting that the data not only reflects the surface data information, but the data reflects the expected behavior pattern. If the data lacks the necessary confidentiality measures and leads to improper use, it is easy to disclose all the information of the individual. At the same time, sensitive data with high commercial value tends to be low in security and policy, which can easily lead to trade secrets or personal privacy leakage and information abuse. The development of big data in China is at the initial stage of exploration, and the current situation of information security is not perfect. In the highly centralized and huge data environment, ensuring data security in the industrial chain has become an urgent problem to be solved. At the same time, diversified data processing methods such as: distributed, collaborative, open and so on, leading to a sharp increase in the risk of data leakage.

The lack of talent is an important factor restricting the development of big data technology, so it is necessary to strengthen the cultivation of agricultural big data talents. There are two main ways to train talents: first, through the training of current staff to improve their processing data skills, in order to alleviate the shortage of short-term talents. The second is to set up major related to big data Agricultural Science in Colleges and universities, so as to cultivate sufficient agricultural big data talents from a long-term perspective. At present, the degree of agricultural information is low and the gap between regions is large, which seriously affects the application of agricultural big data. This is the key to strengthen the construction of agricultural information and promote the development of agricultural big data. Therefore, it is necessary to establish and improve the information construction of agricultural big data, improve the individuation of information services in the application field, and solve the problems of real-time data acquisition. Actively building an all-round, multi-angle, intelligent and personalized agricultural information service has become the driving force behind the application of agricultural big data in China.

To ensure the security of big data priority should be given to the construction of enhanced technical means. Unified security architecture and open data services from the perspective of security technology system. Based on the development of the era of big data, considered from the perspectives of network and data security, disaster backup, security risk and operation management, security governance, etc. Finally, establish a sound data protection security system, strengthen data protection against attacks, anti-leakage, anti-theft and other security protection technologies to ensure the security of building big data. In addition, we can encourage enterprises and institutions to research and develop advanced data security protection technologies. At the same time, in the protection of big data
Agricultural big data is a cross-border application in the agricultural industrial chain, which has undergone major changes and developments in agricultural big data thinking, ideas and technologies. When we face to the misunderstanding in cognition of agricultural big data, the data processing and analysis technology that cannot meet the demand and the security status of the hidden data, we should actively change our concepts, constantly research and develop new technologies, and construct a safety and security system so as to maximize the application of big data in agricultural economic management, and to maximize the guidance function, so as to expand the economic benefits of agriculture.

Under the development trend of big data, we should achieve better outcome in the management of agricultural economy. In order to promote the development of modern agriculture, we should not only change the existing traditional concepts, but also improve the agricultural economic management system according to the characteristics of big data development. Combining with modern agricultural economy and continuously integrating high and new technology is the only way which must be passed to realize the industrialization of agricultural economy. Expanding agricultural economic benefits by driving the development of agricultural product infrastructure. At present, China's agricultural economic management should be reformed and innovated in three aspects which is big data deepens the degree of information, transforms old agricultural management concepts, and improves management systems.

Paying attention to the practical application of the subject of big data agricultural economic management, Attempting to expand the economic management of big data agriculture to the field of resources and environment, and strengthening the development of agricultural industry and coordinating environment are not only an important direction of reaching the real big data agricultural economic management system, but also an inevitable trend of agricultural economic development today.

Agricultural development constantly adapts to the new situation of big data development, continuous improvement in the process of promotion, modest learning from foreign experience in the development of agricultural big data economic management in order that we can reform and innovate China's big data agricultural economic management. Combine agricultural economic management with agricultural industry research to actively complete research on theory and production practice. The first task is make China's big data agriculture development organized, large-scale and market-oriented and inject agricultural economic management research into agricultural industrial chain and value chain. What is more we must improving the knowledge structure system of big data agricultural economic management discipline, and cultivating more highly educated and familiar with big data agricultural technology and market management personnel.

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