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The Development of Regional Agricultural E-commerce in China Based on Big Data Analysis: A Case Study of Potato Industry

Shu Chen[1, 2*]

[1]*Zhanjiang Science and Technology College, Zhanjiang, China*

[2]*Assumption University, Bangkok, Thailand*

31415425@njau.edu.cn

[*]*corresponding author*

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Abstract: In recent years, big data analysis technology has become one of the important research topics in the information field, and has been widely used in many fields such as web search, e-commerce, financial analysis, and medical services. As one of the important industries in the era of big data, e-commerce affects the level of China's social and economic development. As one of the most promising high-yield economic crops in China, potato occupies a considerable proportion in agricultural e-commerce. To this end, this article will take the potato industry as an example and develop regional e-commerce in China based on big data research. This paper uses a combination of SWOT analysis method and literature research method for research, and selects Guangxi Guigang as a case study for analysis. The study found that the total output of fresh potatoes in Guigang City increased from 97,500 tons in 2013 to 215,500 tons in 2019.The average unit area output of fresh potatoes in the past 7 years was 21343.41 kg / hm2, which was equivalent to a yield of 4178.14 kg per 5: 1 / hm2, far exceeding the national unit yield of 3387kg / hm2. It can be seen that with the advent of the era of big data and the development of e-commerce for agricultural products, the potato industry in Guigang is getting better and better.

1. Introduction

With the acceleration of the pace of enterprise innovation, in the continuous optimization of scientific and technological levels, the amount of information that companies need to process is

increasing, and the data processing methods used are becoming more advanced and intelligent. Big data analysis is not only an inevitable choice for the current development of e-commerce enterprises, but also a key content that enterprises must deal with in their daily operations. Especially in the face of an increasingly competitive market environment, big data analysis has become an important development tool for e-commerce companies.

Potato, Solanaceae is an annual herb. Potato tubers and stems can be eaten, both as food and as crops for vegetables. Potato is regarded as one of the most promising high-yield economic crops in China in the new century [1]. Potato is the food and vegetable with the most nutritional value and the potential to increase production and income. It is also a cash crop with the most market demand and processing value-added potential. It has a wide range of uses and strong competitive advantages. The industrial advantage is very obvious. In the context of data analysis, it is of great significance to study the development of e-commerce in the potato industry [2,3].

Potato products are rich and diverse, and processed foods are well received by consumers. With the development of potato food strategies, the research and development of potato products are becoming more and more important. Problems and development suggestions [4]. In 2016, the Ministry of Agriculture issued the "Guiding Opinions on Promoting the Development of the Potato Industry". The industrialization of potatoes as a staple food has brought new opportunities to the development of the potato industry in Heilongjiang Province. VK Bosak analyzed the problems existing in the development of the potato industry in Heilongjiang Province. Countermeasures and suggestions are proposed to promote the development of Heilongjiang potato industry, nutrition-led consumption, and production-led consumption [5]. Starting from the nutritional value of potato, Amy E analyzed the health function of potato staple food in Guangxi and its position in food safety strategy, the advantages of developing potato staple food, and the problems in developing potato staple food. On this basis, it proposed to promote the development of potato staple food in Guangxi. The countermeasures and suggestions provided reference for the development of Guangxi potato staple food [6].

Based on a full analysis of the potato industry research, taking Guigang City, the main winter potato growing area in Guangxi Zhuang Autonomous Region as a research area, by collecting data on potato industry development status in Yulin City and its counties, The development status of potato industry in Guigang was analyzed and expatiated from planting area, planting area and yield. Based on the current status of industrial development, the SWOT analysis method was used to comprehensively analyze the development of potato industry in Guigang.

2. Proposed Method

2.1. Big Data Analysis

With the rapid increase in the amount of data, the traditional methods and tools for analyzing and processing massive data have become inadequate and inefficient. In order to better dig out the hidden information behind big data, people generally use big data analysis methods. Big data analysis is to analyze large-scale data.

For big data analysis, it can be regarded as a process of expanding and analyzing the data layer by layer [7]. It can be regarded as 5 Vs, that is, a large amount of data (Volume), fast speed (Velocity), multiple types (Variety), value (Value), authenticity (Veracity). From the current point of view, big data can be regarded as the most commonly used word in computer information processing and applications at the same time [8]. At the same time, the data security that matches it is improved, in-depth analysis, and deep data mining are realized. Corresponding business value has also become an important source of profit for industry growth [9-10]. In the context of the information age, big data analysis has emerged as the times require [11].

Tool introduction front-end display

Front-end open source tools for display analysis include Jasper Soft, Pentaho, Spagobi, Openi, Birt, etc. Commercial analysis tools for display analysis include StyleIntelligence, RapidMinerRadoop, Cognos, BO, Microsoft, Oracle, Microstrategy, QlikView, Tableau.

(2) Analysis steps

Big data analysis methods include six basic steps:

1) Visual analysis

Whether the subject of data analysis is an expert in this field or an ordinary user, the first requirement for data analysis is data visualization. Visual analysis can analyze and process data more intuitively, allowing users to find results from the data itself.

2) Data mining algorithm

Visualization can be seen, and the main body of data mining is the machine. Use data clustering, data segmentation, and outlier analysis to enter the data to mine information. These data processing methods not only process data quantitatively, but more importantly, occupy the speed advantage of processing data.

3) Predictive analysis ability

Data mining enables data analysts to fully grasp the data, while predictive analysis is to predict and judge the future development trend of data based on two techniques: visual analysis and data mining.

4) Semantic engine

The current data is unstructured and diversified, leading to new problems in data analysis. Therefore, advanced data analysis tools are needed to extract, analyze and judge data. Based on this, a semantic engine is generated, which can intelligently rely on documents to extract relevant information.

5) Data quality and data management

Data quality and data management are best practices in management. According to established procedures and professional tools for data processing, the quality of the results obtained will not deviate from the preset goals.

6) Data storage, data warehouse

Data warehouse is a relational database built to facilitate multi-dimensional analysis and multi-angle display of data stored in a specific mode.

2.2. Agricultural E-commerce

(1) E-commerce

In the narrow sense, e-commerce refers to the business transaction activities that use the Internet as the operating platform. The narrow sense of e-commerce is the business activities carried out by using the existing computer hardware equipment, software equipment and network infrastructure through a network environment connected by a certain protocol [12-13]. This is currently the fastest growing and most promising form of e-commerce. It is the mainstream of e-commerce. It can also be called online transaction. It is the e-commerce that we usually understand [14].

In a broad sense, e-commerce is also called electronic business, which refers to the digitization of various businesses in various industries, including e-commerce, e-government, e-education, e-medical, e-military, and e-government. E-commerce in the broad sense refers to all business-related activities carried out by means of electronics.

E-commerce can provide services such as online transactions and management, and efficient distribution of offline tangible goods [15-16]. It has many functions such as advertising, consultation, online shopping, online payment, product / service delivery, consultation and

profitable transaction management, etc., and can effectively reduce transaction costs, save transaction time, improve transaction efficiency, and have traditional business trade Many advantages not available [17].

(2) E-commerce of agricultural products

Agricultural products are the trading objects of e-commerce. The concept of agricultural products is closely related to the concept of agriculture. In a broad sense, agriculture has also been called big agriculture, which includes plantation, forestry, animal husbandry, and fisheries in the horizontal direction; it includes the pre-agricultural sector in the vertical, that is, the supply sector of agricultural production, the mid-agricultural sector, and the post-agricultural sector, that is, The agricultural product production, transportation, processing, and sales departments, as well as agricultural public service departments, so agricultural products in a broad sense include the products of the above sectors and their primary processed products. Specifically, it mainly includes four categories: plant products, live animals and animal products, fats and oils, and food and beverage products. Agricultural e-commerce is the use of modern information technologies such as the Internet, computers, and multimedia technologies to provide agricultural production and management entities with services such as the purchase, sale, and online payment of agricultural products or services completed on a network platform.

Agricultural electronic commerce organizes agricultural enterprises, merchants, consumers, governments, farmers, logistics centers, distribution centers, certification centers, financial institutions and other organizations through a network platform, and completes agricultural products through the flow of logistics, commercial flow, capital flow, and information flow. Tracking services from information release to logistics distribution. That is to say, agricultural electronic commerce is to fully introduce the electronic commerce system in the entire circulation process of agricultural product production, sales, processing and transportation. The electronic means of transportation is to carry out business activities related to agricultural products before, during, and after delivery.

Agricultural electronic commerce is to introduce an electronic commerce system in the whole circulation process of agricultural products. Before the birth, use the information search function of the e-commerce system to understand the latest market trends and market development trends, Lichuan market information for production decisions, and purchase of production materials; in the production process, timely understand the production information of agricultural products, Guide production, and pay attention to market trends, supply and demand information, and standardization of production; after production, supply and demand sides release supply and demand information through e-commerce platforms, and conduct consultations, online ordering, online payment, and transportation and distribution services, as well as the entire transportation of agricultural products. Real-time electronic tracking services are performed during the process.

(3) Characteristics of agricultural products e-commerce

Although electronic commerce based on information and agricultural products is still essentially a business activity, it has many obvious advantages compared with traditional agricultural business activities, and it has many new characteristics, which are specifically reflected in the following aspects.

1) Low cost operation

First, the implementation of e-commerce for agricultural products can achieve paperless office, and the cost of network information transmission is lower than that of information dissemination media such as letters, telephones, and faxes, which saves communication costs and labor costs. Secondly, the introduction, publicity, and supply and demand information release of agricultural products through the Internet have avoided the opposite conversation under the traditional trade method, saving advertising costs, search costs and communication costs. Thirdly, the production

decision is made under the information sharing of the Internet, which avoids the blindness of production. It makes it possible to reduce agricultural product inventory and optimize resource allocation.

2) Less intermediate links and high transaction efficiency

Buyers and sellers of agricultural products around the world can directly conduct business activities such as information consultation and business negotiation through network platforms without the involvement of agents, wholesalers and other intermediate links, which reduces the intermediate links to a certain extent. The information release, agricultural product purchase, online settlement, and agricultural product distribution services carried out by the supply and demand sides of agricultural products through the network platform do not need manual intervention to transfer information between the departments through the data transmission of the network platform in the shortest time, simplifying the circulation Link, shortening the transaction time and improving transaction efficiency.

3) Limitations across time and space

Agricultural e-commerce can overcome the limitations of time and space and truly realize the globalization of trade. Because of the Internet, almost all corners of the world, any trader can conduct online transactions through the virtual business environment constructed by e-commerce or display their own agricultural products through the Internet. The distance is no longer an obstacle for the two parties to trade agricultural products. Agricultural e-commerce can operate 24 hours a day, regardless of time zone, so that buyers can query and order agricultural products at any time, and agricultural product operators can also conduct 24-hour product promotion and receive orders, which facilitates trade.

4) Transactions are more secure, flexible and transparent

Internet-based agricultural product e-commerce buyers and sellers can carry out the entire transaction process from transaction negotiation, ordering, payment of goods, and distribution of agricultural products. A strong CA certification center guarantees the transparent and safe operation of agricultural e-commerce. Various security technologies such as firewall technology, private / public key encryption, digital signatures, digital certificates, and various secure transaction protocol mechanisms ensure the security of online transactions, and smooth and secure information transmission ensures the verification of various information. Prevent the flow of forged information.

5) Standardization of transactions

The high efficiency of computers and networks is inseparable from standardization. Implementing agricultural electronic commerce not only requires technical standardization, but also includes standardization of various systems, such as certification standards and payment standards. This not only facilitates network connectivity, but also promotes fair competition. At the same time, since the object of agricultural electronic commerce exchange is informational agricultural products and services, it is a virtual agricultural product that informatizes physical agricultural products. This requires attention to the standardization of agricultural production and processing when agricultural products are produced. Standardized transactions have prevented disputes over agricultural trade.

2.3. Potato Industry

(1) Relationship between potato growth and climatic conditions

Potato is a asexual breeding crop, which is resistant to barren, has wide adaptability, tenacious vitality, and the altitude has a small effect on it.The topography mainly affects the distribution of potatoes through cultivation conditions. Wider. Potatoes like to be cold and cold, and afraid of the heat. The temperature has a great impact on the growth and yield of potato plants. The optimum average daily temperature for the whole growth period is 17 ~ 21 ℃, and the effective accumulated

temperature of ≥5 ℃ is 1000-2500 ℃. Variety requirements are higher, 1500-2500 ℃. After the seed potato is sown, it starts to germinate at 5-7 ℃, and the temperature cannot be germinated below 4 ℃; the potato stems and leaves can grow in the temperature range of 7-42 ℃, and the optimal growth temperature is 17-21 ℃. The upper and lower limits are 42 ° C and 7 ° C, respectively. When the temperature is> 42 °C or <7 °C, the growth of stems and leaves stagnates; potatoes can flower in the range of 5-38 ° C, and the optimal temperature is 15-17 ° C; tuber formation The temperature range of swelling is 2-29 °C, the most suitable temperature is 16 -19 °C, the expansion will stop when the temperature is <2 °C or> 29 °C. When the temperature is lower than 0 ° C, frost disaster will occur, causing potato stem and leaf necrosis, Stopping the potato pieces from swelling, affecting potato yield.

Unlike temperature, the length of light mainly affects potato plant height, stolon length, and flower bud differentiation. In North China, the growth period of the potato is 16 hours, the potato plant is taller, the stolon is long, can flower, the potato is slow but the starch content is high; and The sunlight hours in the southern winter cropping area is about 10h, which is not conducive to the differentiation of flower buds. The potato plants are short, stolons are short, do not bloom, and the potatoes are early and fast. In addition, the most suitable daily sunshine hours for the potato growth period is 12 to 13 hours.Different growth stages have different requirements for light. Short days of light are required during germination, short days and strong light at seedling stage, and long days and strong light during germination. Light, the best light conditions in the tuber stage are short daylight and strong light.

Potato is very sensitive to water, too little or too much water will affect growth and development. The potato needs less water during germination and seedling stage, and the soil water holding capacity can be maintained at 50 - 60%; the stems and leaves grow rapidly during the growing stage, and the water requirement for nutrients and water is huge. At this time, the soil water holding capacity needs to be maintained At 70-80%, when the tuber begins to form, the growth of stems and leaves needs to be controlled, and the water holding capacity of the soil needs to be reduced to 60%; during the potato tuber, the expansion of the tuber requires a lot of water supply, dissolving N, P, K, etc. Inorganic elements are absorbed by the roots of potatoes.At this time, the soil water holding capacity should be maintained at 70-80% .If it is too dry, the potato pieces will stop expanding and even deformed potatoes will appear, which will affect potato sales.The soil is most suitable for water retention in the late potato tuber stage. The degree is 50-60%. Rotten potatoes will appear when the soil is too moist. The soil moisture content should be appropriately reduced to promote the epidermalization of the potato skin, which is convenient for harvesting and storage.

Potatoes can be planted on many types of soil. The soil is deep, loose, well-ventilated, and moist and cool. The best planting environment is potato. The most suitable soil is slightly acidic and light soil. Studies have shown that most potatoes are planted in soil with pH 4.8.7.0, with pH 5.0.5.5 being the most suitable. Overacid or overalkali will cause poor potato growth and yield decline. When the soil pH is less than 4.8, the soil is too acidic, and the plant color becomes pale, which is prone to leaf curling, plant dwarfing, and premature decay.When the soil pH is more than 7.0, the soil is strongly alkaline, and some potato seeds cannot normally emerge. The potato skin is easily damaged and easily infected with sores and other diseases, resulting in a sharp decline in production.

(2) Advantages of the potato industry

1) High efficiency of potato planting

Potato is a big crop after wheat corn rice. The potato has good adaptability to the environment, drought resistance, disaster resistance, barren tolerance, can be grown on a large scale, and the yield is high. The harvest index can reach 70% to 80%. Under the same planting conditions, the potato yield is corn. Twice, with high potential for increasing production. Coupled with the short growing

period of potatoes, they can also be planted at any time, so it is of great significance to impoverished areas where the planting cycle is restricted or environmental conditions are not good.

2) Evaluation of potato processing benefits

The economic benefits of potatoes are very high, and the value-added space is huge. There are many uses for potatoes, mainly vegetables, grains, feed and industrial raw materials. Potatoes can be processed into a variety of foods, such as starch potato chips. Potato as a raw material can also produce many derivatives, such as glucose, hormones, alcohol, etc., with high economic value.Potatoes can also be used in other industries, such as textile, printing, paper, medical, petroleum and other industries. As a binder, stabilizer or additive, it can be used as an additive for vitamins, medicaments and enzymes in the medical field. Potatoes can produce thousands of products, and the market prospect is very good and the economic value is extremely high. Compared with wheat and corn, potatoes have great advantages, higher yields and better economic benefits. The average yield per mu is 1,000 kilograms, and the price per kilogram of potatoes on the market is 50 cents.

3) Strong driving effect of potato industry

The development of potato processing production lines can increase farmers' economic income. Therefore, more potato production and processing enterprises need to be developed. Studies have shown that large and medium-sized enterprises with standardized potato production lines can lead 40,000 to 90,000 farmers who grow potatoes to improve their economic level. Moreover, it can also improve the development of other industries, such as planting, processing and breeding, service, transportation and other comprehensive industries, making the economic benefits of these industries greatly improved. It can be seen that the potato industry is of great significance and value to the economic development of a region, the improvement of the economic level of rural farmers, and the continuous development of the township economy.

3. Experiments

3.1. Research Methods

(1) Literature research method

The literature research method is the main method of this article. This paper conducts research by using references, combining theory with analysis, and using qualitative analysis and comparative analysis.

1) Literature research is a kind of qualitative analysis and the most common basic method for agricultural industrialization research.

2) The comparative analysis method refers to comparing two or more things, comparing differences and similarities.

(2) On-site inspection method: Obtaining relevant research materials and key data by using two methods: visit and household survey.

(3) SWOT analysis method: SWOT analysis method, that is, situation analysis, is to list various major internal advantages, disadvantages, and external opportunities and threats that are closely related to the research object, and then list them in a matrix, and then arrange them in a matrix form. With the idea of systematic analysis, various factors are matched to each other for analysis, and a series of corresponding conclusions are drawn from them. The conclusions usually have a certain decision-making rigidity.

3.2. Research Object

(1) Selection of research objects

The winter crop potato winter crop industry has a good development momentum. The southern winter cropping areas include Guangxi, Guangdong, Hainan, Fujian, and Taiwan. The planting area accounts for about 5% of the country. Potatoes are cold and cool, suitable for planting in autumn and winter in Guangxi. Guangxi is a nationwide One of the three major areas of the three major food and chemical industries of the potato, there are about 670,000 hm2 of winter idle fields after the harvest of middle and late rice every year, plus about 330,000 hm2 of young orchards and dry winter lands. Unique advantages. In this paper, Guigang City, a typical representative region of winter crop potato in Guangxi Zhuang Autonomous Region, was selected as the object of field investigation and research.

(2) SWOT analysis of potato industry development in Guigang

The SWOT analysis method is used to analyze the natural resource conditions, location development advantages, industrial development policies, planting systems, cultivation technology and industrialization degree, storage and transportation technology, and sales channels of the potato industry in Yulin from the perspective of advantages, disadvantages, opportunities and threats. As well as the analysis of conditions and problems such as natural disasters, we further expounded and demonstrated the development of potato industry in Guigang from multiple methods.

3.3. Data Sources

The data used in this article are from the National Bureau of Statistics of the People's Republic of China, the "Guangxi Yearbook" and the Bureau of Statistics of Guangxi Autonomous Region. Part of the data for the Guigang case analysis is from the "Guigang Yearbook" and "Guigang Statistical Yearbook".

4. Discussion

4.1. Development Analysis of Guangxi Potato Industry Based on Big Data Analysis

In Guangxi, potatoes are planted throughout the year from south to north, but they are mainly winter potatoes. Most of them are planted in rice fields after harvesting of middle and late rice. Guangxi has been planting potatoes for more than 100 years, but it has mainly been sporadic.The cultivation method is mainly single cropping and some intercropping. . With the development of agricultural e-commerce, it has given Guangxi potato industry a good opportunity for development. Based on the analysis of big data, the development of the potato industry is analyzed. Guangxi ’s potato planting area and total fresh potato output in 2010-2019 As shown in Figure 1, the yield per unit area of fresh potatoes in China and Guangxi between 2010 and 2019 is shown in Figure 2.

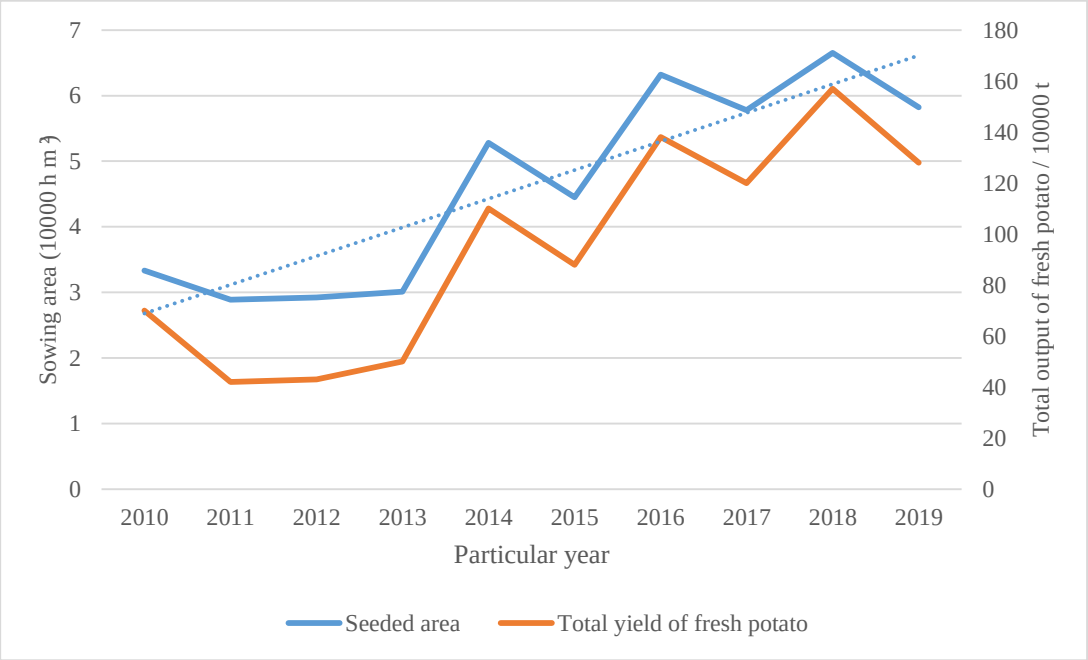

Figure 1. Analysis of potato planting area and total yield of fresh potato in Guangxi in 2010-2019

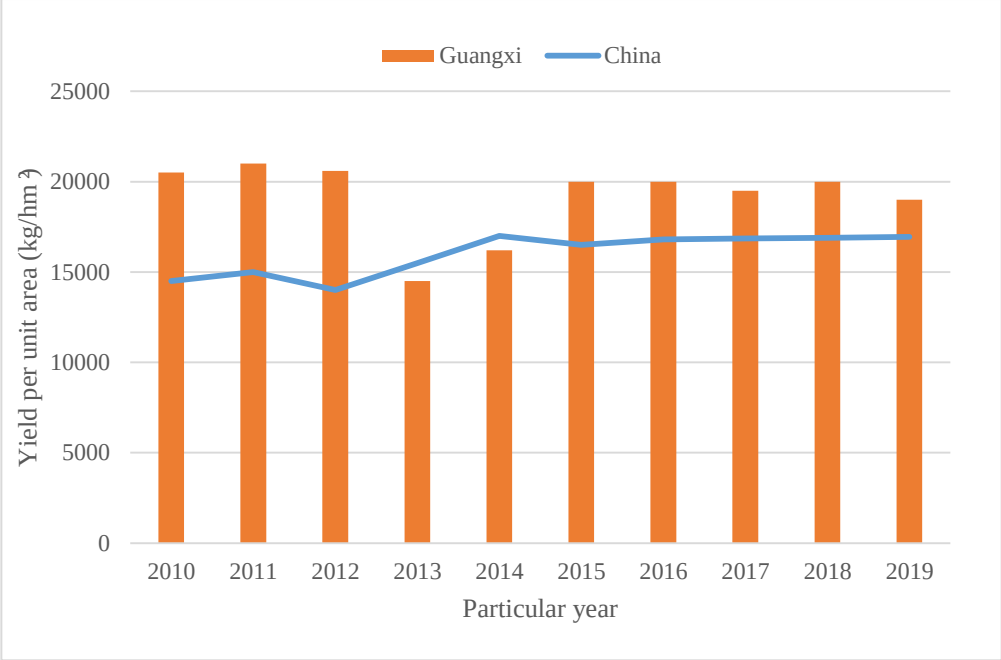

Figure 2. Comparison and analysis of potato fresh potato yield per unit area between China and Guangxi in 2010-2019

It can be seen from Figure 1 and Figure 2 that the potato planting area in Guangxi has grown from 33300 hm2 in 2010 to 61600 hm2 in 2019. From 2010 to 2016, affected by the adjustment of agricultural structure, price fluctuation and natural disasters, the potato planting area in Guangxi has increased in a wave like manner and maintained stable development in general. In 2010, the total output of potato fresh potatoes was 204.2 million tons, which was converted into 136000 tons by 5:1. By 2019, the total output of potato fresh potatoes increased to 1195800 tons, which was

converted into 239200 tons by 5:1. Compared with 2010, the total output of potato fresh potatoes increased by 70%. The potato per unit yield fluctuated greatly. The potato per unit yield decreased significantly in 2013. During the ten years from 2010 to 2019, the average potato per unit yield in Guangxi was 19918.47kg/hm2, which was converted into 3889.13kg/hm2 by 5:1, 1.2 times of the national per unit yield, slightly higher than the national per unit yield, making a significant contribution to the realization of four consecutive increases in Guangxi's grain production.

The potato production in Guangxi in 2019 is shown in Table 1.

Table 1. Statistics of potato production in Guangxi in 2019

Municipalities	Area (10000 hm²)	Fresh potato output (10000 t)	Fresh potato yield(kg/hm²)
Nanning City	0.64	12.60	19626.17
Liuzhou City	0.21	3.57	17000.00
Guilin City	0.52	10.02	19393.55
Wuzhou City	0.69	11.36	16447.88
Beihai City	0.29	5.47	18775.74
Fangchenggang City	0.11	1.68	15652.17
Qinzhou City	1.13	20.88	18477.88
Guigang City	1.00	23.74	23851.31
Yulin City	1.02	21.05	20704.92
White Market	0.05	0.93	18851.35
Hezhou	0.04	0.68	17894.74
Hechi City	0.11	1.14	10426.83
Laibin City	0.24	4.49	18865.55
Chongzuo City	0.13	1.99	15466.32
Total	6.16	119.58	19403.94

As can be seen from Table 1, potato planting area in Guangxi reached 61,600 hm2 in 2019.The cities with relatively large planting areas are Qinzhou, Yulin, Guigang, Wuzhou, Nanning, and Baise, Hechi, Liuzhou in the northwest due to altitude. In terms of total output, in 2019, the total output of fresh potatoes in Guangxi was 1.196 million tons, equivalent to 239,200 tons of raw grain output.The top five cities in total output were Guigang, Yulin, Qinzhou, Nanning, Wuzhou, and Guigang City. Ranked first in total potato output in 2019 with a total output of 237,100 tons; in terms of unit yield, the unit yield of potato in Guangxi in 2019 was 19403.94 kg / hm2, and the highest yield per unit was Guigang 23851.3lkg / hm2, Yulin 20704.92kg / hm2, Nanning 19626.17kg / hm2, Guilin 19393.55kg / hm2, Guigang City, which ranks first in yield, is 23851.31kg / hm2, which is 1.38 times the level of China's yield.

The rapid development of Guangxi's potato industry has made a significant contribution to Guangxi's grains' 30 billion pounds again, making Guangxi the largest winter potato production base in southern China.

Guangxi potato seed potatoes are mostly transported from other places, and the seed potato market is mixed, so there are many potato varieties. The main potato planting varieties are Feiwuduita, Atlantic Ocean, Zhongshu No. 5, Zhongshu No. 7, Cooperative 88, Kexin No. 13, Ji

Zhangshu 8 and Lishu 6 etc. At present, there are three main farming modes of potato in Guangxi. The first is the "rice-rice-potato" model, that is, planting potatoes in the paddy field after double-season rice harvesting to improve land utilization; the second is "rice-potato "Mode, that is, in a single-season rice area, after early or middle-early rice is harvested, one potato is planted to increase farmers' income; the third is inter-crop interplanting, such as pitaya interplanting potatoes, grape interplanting potatoes, sugarcane interplanting potatoes, and bananas. Interplanting potatoes, etc., a variety of inter-planting modes solve the problem of planters' employment during agricultural leisure, which is conducive to increasing yields and incomes. At present, Guangxi potato products are mainly fresh potatoes. Most potatoes are delivered to the market after harvesting from the field, and the proportion of production and processing is very small. Compared with other potato-growing provinces, potato processing in Guangxi is in its infancy. There are few potato processing enterprises. The existing processing enterprises are small in scale, small in number, single in product variety, imperfect in the industrial chain, and weak in driving effects.

4.2. Analysis of Potato Industry Development in Guigang City Based on Big Data Analysis

Guangxi Guigang was selected as a case study object. Based on the analysis of big data, the development of potato industry in Guigang was analyzed. Guangxi Guigang City is located in the central and southern part of Guangxi Zhuang Autonomous Region in southern China. Guiping City, Pingnan County. It is located at 22° 74′ ~ 23° 93′ north latitude and 109° 24′ ~ 110° 6′ east longitude. It belongs to a humid subtropical region and is rich in light, temperature and water resources. The potato has been planted in winter for a century, and the potato planting area and the total output of fresh potatoes in Guigang from 2013 to 2019 are shown in Table 2 and Figure 3.

Table 2. Statistical analysis of potato planting area and total fresh potato output in Guigang City from 2013 to 2019

Municipalities	Area (10000 hm²)	Fresh potato output (10000 t)	Fresh potato yield(kg/hm²)
2013	5295	9.75	18413.60
2014	6119	14.30	23369.83
2015	7900	17.50	22151.90
2016	8027	18.15	22611.19
2017	11190	22.91	20473.64
2018	10134	21.97	21679.49
2019	10167	21.05	20704.92

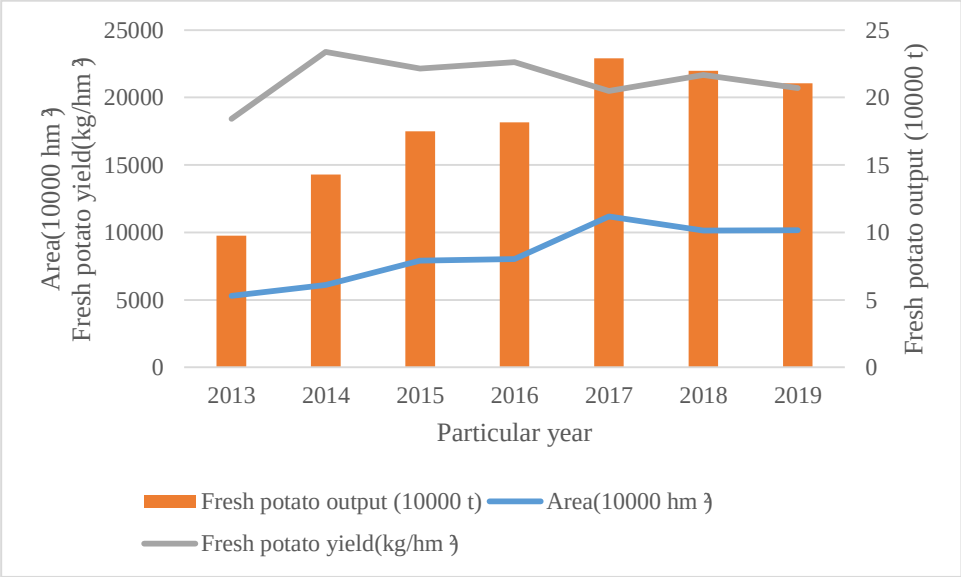

Figure 3. Analysis of potato planting area and total fresh potato output in Guigang City from 2013 to 2019

Based on the analysis of potato production in Guigang City from 2013 to 2019 from Table 2 and Figure 3, the potato planting area in Guigang City has grown rapidly, showing an overall upward trend. The planting area has rapidly expanded from 5295hm2 in 2013 to 101671hm2 in 2019. Some time. The total output of fresh potatoes has increased from 97,500 tons in 2013 to 215,500 tons in 2019.The average unit area output of fresh potatoes in the past 7 years is 21343.41 kg / hm2, which is equivalent to 51.7 in terms of yield of raw grain per unit of 4.278 kg / hm2, far exceeding the national average Yield per unit area of 3387kg / hm2.

Statistics on potato production in various counties and districts of Guigang City in 2018 are shown in Figure 4.

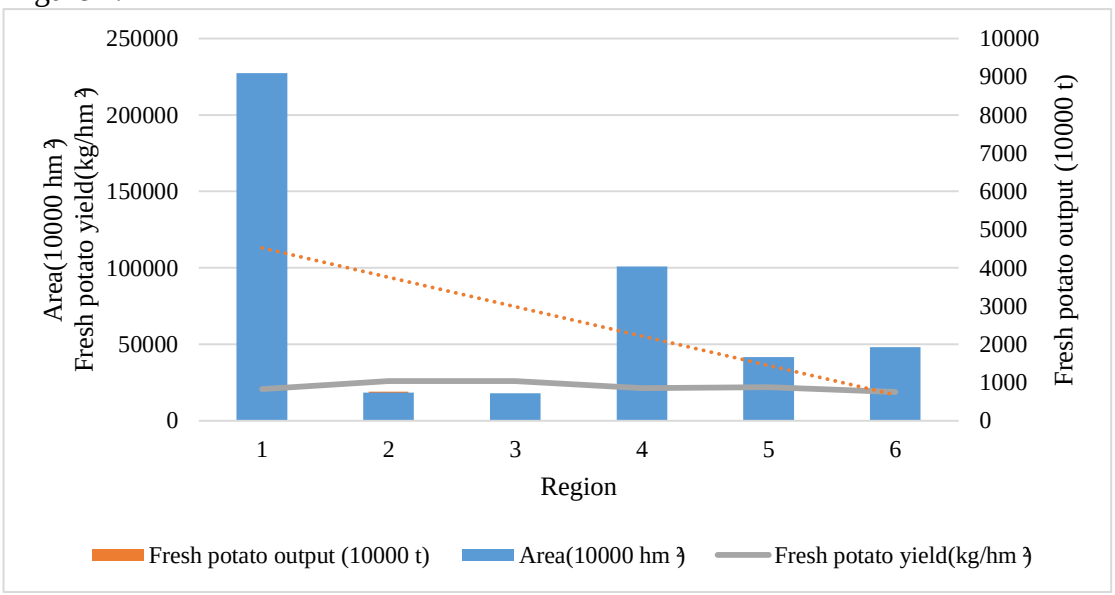

Figure 4. Statistical analysis of potato production in each county and district of Guigang City in 2018

The six areas in Figure 4 represent Guigang City and five areas under the jurisdiction of Guigang,

that is, the area numbers in the figure represent Guigang City, Gangbei District, Gangnan District, Qintang District, and Guiping City and Hepingnan County, as shown in Figure 4. In Guigang City, the cultivation of boll potatoes is mainly concentrated in Qintang District and Hepingnan County of Guiping City. Potato planting area and output in these three areas account for most of Guigang's entire area. Relative planting in other areas is relatively small, but there are Great development potential.

4.3. SWOT Analysis of Potato Industry Development in Guigang

(1) Advantage analysis

1) Excellent natural resource conditions

Potatoes like to be cold and cold, and afraid of heat. The temperature has a great impact on the growth and yield of potato plants. The optimal average daily temperature for the entire growing period is 17-21 ℃, and the precipitation is preferably 400-500mm. At each stage of growth Both require strong light and high soil permeability. Guigang City is located in the southeast of Guangxi Zhuang Autonomous Region.The climate type is a subtropical monsoon climate with an average annual temperature of 22 ℃ and an average winter temperature of 12-21 ℃. It is rich in precipitation with an average annual rainfall of 1650mm and an average winter rainfall of 41mm. The sunshine time is 1795h, and the conditions are very suitable for potato growth. The good geographical environment and suitable temperature conditions make the conditions for winter potato growing in Yulin City unique. The soil texture of Guigang City is excellent. Potatoes need rich minerals to grow. The red soil contains aluminum elements that are beneficial to potato plant growth and development.

2) Good long-term economic benefits

Winter is not idle, the benefits are doubled. On the one hand, by promoting the development of winter potato, it is possible to make full use of the surplus labor force, and to make comprehensive use of the climatic and land resources such as light, heat, and water in Guigang City, increase the multiple crop index, promote industrial development, ensure food production security, and promote Increased agricultural efficiency, farmers' income and rural economic development. On the other hand, winter potato can be used to fertilize farmland.Potato growth, especially during potato production, requires a lot of nutrients. At present, a large part of the nutrient surplus is applied to the fertilizer applied per acre, which balances and increases soil nutrients and increases crop yield for the next season. Make contributions to improve the ecological environment of the farmland; In addition, after the potato is harvested, the stems and leaves can be returned to the field after being warmed and watered, and can be used as organic green manure for spring rice growth to improve soil fertility; the stems and leaves can also be treated with a reasonable ratio It can be used as animal feed to promote the healthy development of eco-agriculture and create high benefits of potato off-season cultivation.

3) High off-season marketing price

Guigang City has a large area of winter idle fields, which can be eliminated by planting potatoes, improving the comprehensive land utilization rate, and bringing benefits to farmers. Potato prices have a seasonal fluctuation trend. From December to May each year is the period when potato prices rise. After May, they begin to fall, showing a typical "N" shape of "up, down, and up". The best time to plant winter potatoes in Guigang is from mid-October to mid-to-late November.The next year, they are successively harvested and marketed in April.The other potato seasons in the country are harvested from May to December. Therefore, 1 -April belongs to the off-season of potato supply in China. The potato supply is not connected to the yellow and the demand is strong. The price of potatoes has entered the price increase range. The harvest and listing period of

Guangxi winter-growing potatoes just fills the gap in the potato fresh potato market. Because the potatoes are stored in the cellar, the price is usually higher.

(2) Disadvantage analysis

1) The seed potato system is not complete

The amount of potatoes used per acre is large, about 350 pounds, and winter potatoes need potatoes in September, but because of the tropical monsoon climate and subtropical monsoon climate in Guangxi, July to August is in a high temperature period, and the temperature is too high to breed large areas; At present, some experts and scholars have researched aerosol cultivation in greenhouses, but the cost is too high, about 3 yuan per grain, and the number of plants per acre is 4500 ~ 5000, about 3000-4000 grains, based on 3 yuan per grain. However, the cost of potato seeds alone is as high as 9,000 ~ 12,000 yuan, which is too high for potato planting to make ends meet. At present, Guangxi does not have a large seed potato breeding base.The seed potato is mainly transported from the northern region (mainly Inner Mongolia) to Guangxi.The transportation cost is high, the adoption rate of detoxified varieties is low, and the supply of high-quality seed sources is insufficient, which has become a limitation for large-scale development of the potato industry. factor.

2) Lack of deep product processing

At present, China's annual total starch production is far from meeting actual demand, and most of it depends on imports, and the potential for deep processing of potatoes is huge. Guigang City is vigorously promoting the cultivation of winter-type potatoes, but the sales of commercial potatoes are mainly fresh food sales, and less than 20% are used for processing, and most of the processing is for the initial processing of products, with low added value, lack of potato deep-processing enterprises, and deep-processing parts. The proportion of the total output is extremely low, the industrialization development lacks the large-scale "leading" enterprises, the industrial chain is too short, the lack of deep processing, and the level of industrialization is low.

3) Sales channels are not smooth

After the potato is harvested, the marketing channel is a guarantee in the potato marketing process and directly affects the results of potato sales. At present, the organization level of winter potato in Guigang is relatively low, and the production and marketing information is not updated in time. A small part of potato sales uses direct marketing channels. Farmers sell their products to consumers on their own prices, but they need to occupy more time and energy for farmers, and their actual income is slightly lower. The acquisition of middlemen accounts for the majority of winter potato sales in Guigang. Foreign vegetable merchants purchase and uniformly transport them to the wholesale market in the place of sale. However, because the intermediaries are scattered and the potato is more homogeneous, the acquirer will greatly reduce it for its own benefit. The purchase price resulted in a low purchase price and a high market price, the middlemen profited greatly, and the farmers' income was damaged.

5. Conclusion

Agricultural products are basic products related to national economy and people's livelihood. Since the reform and opening up, although China has a large population and a small population, but relying on scientific and technological progress and a large amount of investment in human, financial and material resources, China has basically solved the problem of food and clothing, agricultural products are even near and some are in excess of supply. With the advent of the era of big data, China's rural economy Development has entered the development process of marketization, urbanization, and informatization. Although e-commerce has developed rapidly in cities, the development of e-commerce technology in rural areas in China needs to be further improved. The potato industry is taken as an example to study the development of regional agricultural

e-commerce in China under the background of big data analysis.

Based on a full analysis of the potato industry research, taking Guigang City, the main winter potato growing area in Guangxi Zhuang Autonomous Region as a research area, this paper collects the potato industry development data such as potato production in Guigang City and its counties. Analysis and elaboration of the development status of potato industry in Guigang City in terms of area, planting area and yield. Based on the current status of industrial development, the research uses SWOT analysis methods to comprehensively analyze the development of potato industry in Guigang from the perspective of advantages and disadvantages.

The research results in this article show that Guigang's potato industry has obvious advantages in development, which are mainly reflected in its unique natural resource conditions, considerable economic benefits, and high off-season sales profits.At the same time, Guigang's potato industry is growing in seed potato breeding, product processing, and efficient. There are still deficiencies in storage and transportation and brand building, and further improvements are needed.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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