

Research on the Development of Modern Agriculture Industry in Northeast China

--A Case Study of Heilongjiang

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Abstract

With the development of the national economy and the continuous improvement of people's living standards, the Northeast region regards agriculture as the cornerstone of the development of the real economy. Detailed divisions have been made for the goals of agricultural development. By integrating existing agricultural resources and utilizing agricultural products and services as means, the region actively upgrades advanced rural production machinery and agricultural cooperative operation models. After a thorough investigation of the basic principles of modern agricultural industry, this study will explore the theoretical foundation issues, strategic choices, and specific countermeasures faced by the modern agriculture industry and enterprises in Heilongjiang, with the aim of providing insights for the development of modern agriculture industry in the Northeast region.

Keywords

Northeast China; modern agriculture; industry.

1. Introduction

With the development of the national economy and the continuous improvement of people's living standards, modern agriculture in China exhibits various differences compared to traditional agriculture. As the foundation of modern agriculture, it fully utilizes the advantages of regional resources, with strong commercial characteristics and economic efficiency, but also has certain shortcomings. For example, modern agriculture is more vulnerable to the influence of consumer markets and has certain limitations. The development of modern agriculture industry in China started relatively late, and its production sectors can be divided into characteristic processing industry, characteristic planting industry, and characteristic tourism industry. These production factors mainly come from external sources, not only meeting the self-demand of farmer producers but also better responding to the national economic development. In the past four decades of reform and opening-up, China's modern agriculture has achieved significant accomplishments. The production of staple grains has gradually been replaced by cotton, sugar corn, and soybeans, solving the long-standing problem of inadequate supply of major agricultural products. Since the new millennium, the central government has actively promoted agricultural structural adjustment through various policies, especially from 2006 to 2010 when more specific and detailed policy requirements were put forward to promote the development of modern agriculture. From 2012 to the present, we have strived to follow the deployment of agricultural production supply-side reform, issued relevant policies, and achieved continuous increase in output. In 2014, the "Seven Areas and Twelve Belts" strategic layout requirements were proposed. In 2017, modern agricultural special products were identified as the main industry driving farmers' income growth. China's modern

agriculture has transformed from an insufficient supply to self-sufficiency, contributing to the increase of people's income and promoting their well-being and prosperity.

Modern agriculture and its industry have made remarkable achievements at three levels: agricultural regions, agricultural industries, and agricultural operating entities. Firstly, in terms of agricultural regions, a regional pattern dominated by regional resource advantages has been formed nationwide. For example, Heilongjiang has formed a rice-growing area with Wuchang as the main city in the black soil region. Daxing'anling has become an important blueberry production area, and Qiqihar is a center for cattle breeding. Beidahuang Group has become the main soybean production area. In the southern regions, Chongqing has initially formed a sericulture industry with Fuling and Qianjiang as the main areas, while Yunnan has become a major flower production area. These regional layouts fully demonstrate the full utilization of modern agricultural industry resources and the continuous improvement of the specialization level of agricultural production, which contributes to the steady development of the agricultural economy. Secondly, at the industrial level, the marketization of modern agriculture is gradually taking shape. Various regions have established their own modern agricultural production enterprises and brands. For example, the quality of Xiangshui rice in Heilongjiang ranks among the best in the country, and over 1,700 green organic agricultural products in Inner Mongolia have obtained pollution-free certification. Lastly, the diversification of agricultural operating entities and the development of various forms. The country is gradually transitioning from a household responsibility system to agricultural organizational forms, such as company farmers, cooperative farmers, and other professional modern agricultural forms, significantly reducing unnecessary costs in agricultural production, transportation, and sales.

2. Theoretical Foundations

2.1. Hierarchy of Needs Theory

In 1943, Maslow published his famous theory of hierarchy of needs in "Psychological Review," which categorized human behavior and thinking activities into five basic needs: physiological needs, safety needs, social needs, esteem needs, and self-actualization needs. According to these five basic needs, they are satisfied in an incremental manner. According to Maslow's hierarchy of needs theory, as society progresses, the quality of life for the public continues to improve. At the same time, they also begin to seek more spiritual pleasures and achieve deeper levels of personal success, thereby finding more opportunities and challenges in a broader world. Therefore, modern agriculture and its related industries can bring more opportunities and challenges to this process, promoting sustainable social development. Modern agriculture not only provides material satisfaction for people but also brings a sense of accomplishment for the development of farmers and related agricultural industries, enriching their inner worlds.

2.2. Sustainable Development Theory

The theory initially originated from the release of the Declaration of the United Nations Conference on the Human Environment in 1972, aiming to address global difficulties and first proposed the concept of development. This concept aims to promote global social sharing of resources and achieve the theme of green development, ensuring that people in the next century can smoothly achieve their own progress. It represents global actions for the development of environmental benefits. In 2002, the United Nations held a conference themed "Sustainable Development," acknowledging that sustainable development remains a common goal of humanity, and it is closely related to people's living environment, economic system, and social structure. It is necessary to promote comprehensive development of humanity at higher levels and faster speeds through a good ecological environment and economic development. In 1994, the "China Agenda 21" first expounded China's concept and strategy of sustainable

growth. With the strengthening of the Fifth Plenary Session of the 14th Central Committee of the Chinese Communist Party, China regards achieving shared prosperity and a harmonious and beautiful future for all as an important strategy and mission. The Sixteenth National Congress further considers realizing this grand vision as a core task for China's future, striving for China's modernization, high quality, and green development.

Agriculture has a strong dependence on limited natural resources and is directly influenced by natural resources. China's modern agricultural products have formed a unique and internationally standardized modern operation model by relying on local natural environment, meteorological conditions, crop quality, and market trends, using innovative techniques and scientific management systems. This model achieves sustainable utilization of resources, environment, and social benefits while ensuring economic and social benefits, realizing sustainable economic development. Through continuous efforts, we hope to achieve rapid and long-term growth of Chinese characteristic agricultural products.

3. Agricultural Industry Status Quo in Heilongjiang

3.1. Overview of the Development of Modern Agricultural Industry in Heilongjiang

On the map of China, Heilongjiang is located in the northeast, with its own rivers flowing through it. It is crossed by the Wusuli River and borders Russia. The province has a land area of 473,000 square kilometers, including the sub-provincial city of Harbin, the magnificent town of Qiqihar, 10 local administrative institutions, 1 administrative district, 64 towns, 18 townships, 45 administrative villages, and 1 independent autonomous county. Heilongjiang is one of the major agricultural provinces in China, and its superior natural environment makes it an agricultural powerhouse with excellent cultivation conditions, enormous potential, and the ability to create a more prosperous future. As of 2021, the total agricultural output value in Heilongjiang exceeded 409.955 billion yuan, and the agricultural structure continued to optimize, making positive contributions to the development of agriculture in Northeast China. In our province, the current total arable land is 257.49 million mu, ranking first among all categories of arable land. Our black soil coverage rate is high, accounting for 56.1% of the entire category of arable land, providing favorable conditions for our crops and mechanized crops. Our ecological environment is excellent, and we have been recognized as a major green food supply area with 913.71 million mu. After years of efforts, the quality and safety level of our province's major edible agricultural products have always remained at a high level of 98%. In addition, our modern agriculture has made significant progress, with an annual average cultivated area of 210 million mu and an annual average income of 150 billion catties, maintaining the first position nationwide. In 2022, the total grain planting area in the province was 2,202.48 million mu, with a total output of 155.26 billion catties. As a province mainly focused on animal husbandry, the province's dairy cattle inventory reached 1.103 million head, ranking fourth in the country, and its production of fresh milk is also considerable at 5.012 million tons, ranking third nationwide. The number of beef cattle raised for slaughter was 3.114 million head, the number of pigs raised for slaughter was 23.173 million head, and the meat production reached 3.115 million tons, with an egg production of 1.078 million tons. The integration process of the livestock industry has accelerated with the injection of Wanda Mountain and Yili modern agricultural production enterprises.

3.2. Analysis of the Social Environment of Modern Agricultural Industry in Heilongjiang

Heilongjiang, as one of China's main grain-producing areas, has maintained high grain production for many years and ranks among the top in the country. The success of Heilongjiang is attributed to abundant soil resources, a beautiful natural environment, and advanced agricultural science and technology. These factors have collectively promoted the tremendous economic growth of Heilongjiang and played a crucial role in ensuring the national food supply. In addition, Heilongjiang is committed to establishing a complete grain industry chain, involving various aspects from harvesting to transportation and sales. The rise of grain deep processing industry provides new opportunities for value-added agricultural products, effectively promoting the growth of total agricultural output value.

The modern agricultural industry in Heilongjiang includes fields such as animal husbandry and crop cultivation, covering products such as beef and mutton, dairy products, mushrooms, blueberries, and black fungus. Livestock farming and green agricultural products are popular throughout the country and are essential components of China's agricultural GDP growth. In terms of business models, enterprises adopt modern agricultural digital sales platforms and new distribution systems to sell agricultural products through agricultural internet distribution platforms, pushing high-quality agricultural products to the national and even global markets. The rise of modern agricultural e-commerce has promoted economic income for agricultural producers, expanded the upstream and downstream industry chains, and orderly and linearly promoted the growth of total agricultural output value. Heilongjiang Province actively carries out structural adjustments on the supply side of agricultural products, vigorously eliminates inefficient and ineffective methods, improves the hierarchical structure and quality of agricultural products, injects vitality into the production of modern agricultural industry in Heilongjiang, and continues to promote the growth of the industry.

3.3. Analysis of Industrial Development and Operational Capabilities of Heilongjiang Beidahuang Group

3.3.1. Analysis of Industry Types of Heilongjiang Beidahuang Group

"The granary of the North, that's Beidahuang" is the recognition of the agricultural industry in Heilongjiang Beidahuang by the people, and it is also an affirmation of the efforts and achievements of three generations in agricultural production. Beidahuang Agriculture is located in Heilongjiang Province, with a total land area of 5.5663 million hectares, vast and extensive. However, due to historical reasons and backward agricultural production technology, the inherent resources are relatively limited. The lack of environmental protection awareness in the past has led to the destruction, waste, and underutilization of natural resources. The rampant occurrence of agricultural pests and diseases has also seriously hindered the development of basic agriculture and modern agriculture in Heilongjiang, hence the name Beidahuang. However, through the hard work, meticulous management, and rational operation of three generations, the agricultural industry in Heilongjiang has undergone tremendous changes from insufficient per capita to basic prosperity in each family and then to comprehensive well-off.

In its over 70 years of establishment, Heilongjiang Beidahuang Group has accumulated a total production of 250 billion kilograms of grain, with rapid growth. The business of Beidahuang Group covers the production, storage, sales, and related construction of grain products. Firstly, grain production is crucial for national development and people's livelihood. The annual production is expected to exceed 44 billion kilograms, with commercialized grain accounting for 96.04% of the total share of the province and 43% of the total amount. These data are constantly increasing every year and have formed a fixed measure. Secondly, Beidahuang Group has vigorously upgraded the storage and circulation of agricultural products, introduced

updated drying and storage equipment to better cope with market risks, and protect its own agricultural enterprises from the impact of foreign rice and soybean enterprises. Lastly, it is crucial to build a grain market system, as no matter how outstanding agricultural production is, it needs to be integrated with the national economy and market economy. Beidahuang Group has gradually developed into a dominant purchasing and sales enterprise and grain processing enterprise, establishing relevant supply and marketing enterprises and regional supply and marketing networks to facilitate the smooth flow of agricultural product links and promote the realization of the real economy and production efficiency of the agricultural industry.

3.3.2. Analysis of Annual Financial Capability Indicators of Beidahuang Group

3.3.2.1 Company Overview

Heilongjiang Beidahuang Corporation was established on November 27, 1998, and listed on the Shanghai Stock Exchange in 2002. Its business scope includes agricultural production, tobacco cultivation, production technology research and development, sales, as well as real estate sales and leasing, and other related composite businesses. The group is one of the leading enterprises in the development of agricultural industry in Heilongjiang. With strong support from national agricultural policies, it takes characteristic agricultural products as the leading factor, allocates advanced agricultural production technology equipment, maximizes the advantages of agricultural resources, and expands the overall advantages of the agricultural industry in Heilongjiang.

3.3.2.2 Financial Indicator Analysis

(I) Profitability Analysis

Table 3-1 Profitability Indicators Analysis of Beidahuang Group from 2018 to 2022

Indicator Name	2018	2019	2020	2021	2022
Return on Equity (%)	15.58	13.02	14.67	12.29	13.95
Return on Equity - Diluted (%)	15.00	12.76	14.22	12.07	13.57
Gross Profit Margin (%)	84.67	85.83	46.18	42.87	39.55

By examining the values of return on equity and gross profit margin, higher absolute values indicate better asset quality and stronger ability to generate profits from the market. In analyzing the Beidahuang Group's performance from 2018 to 2022, the return on equity remained relatively stable with no significant fluctuations. However, there was a slight decrease in 2019 and 2021, which may have been influenced by the COVID-19 pandemic and market conditions. The rapid growth of the gross profit margin indicates that agricultural products are popular and have a high cost-effectiveness, providing strong convincing power in the market.

(II) Debt-paying Ability Analysis

Table 3-2 Debt-paying Ability Indicators Analysis of Beidahuang Group from 2018 to 2022 [4]

Indicator Name	2018	2019	2020	2021	2022
Debt Ratio (%)	20.89	18.04	16.93	16.42	15.52
Current Ratio (%)	1.97	2.27	2.53	2.64	3.11
Quick Ratio (%)	1.81	2.10	2.36	2.50	2.94

The debt ratio is an accurate measure of a company's ability to bear long-term liabilities. Generally, lower values are more favorable for the development and daily operations of a company. From the five-year balance sheet data of the company, it can be observed that the company has been decreasing its borrowings while continuously improving its owned assets and operations. The weighted value calculated by dividing the current ratio by the quick ratio formula is 2, indicating an increasing debt-paying ability. However, the ratios for each year are

close to 1, indicating that Beidahuang Group lacks short-term debt-paying ability. It may take longer for accounts receivable to convert to cash, and the repayment time for borrowed funds is extended, which is not conducive to the company's operations at a certain stage.

(III) Operating Capability Analysis

Table 3-3 Operating Capability Indicators Analysis of Beidahuang Group from 2018 to 2022.

Indicator	2022	2021	2020	2019	2018
Total Asset Turnover Days	686.7	799.6	885.3	915.2	861.2
Inventory Turnover Days	25.48	34.04	44.38	50.59	371.4
Accounts Receivable Turnover Days	--	--	1.434	1.981	4.137
Total Asset Turnover Rate	0.524	0.45	0.407	0.393	0.418
Inventory Turnover Rate	14.13	10.58	8.111	7.116	0.969
Accounts Receivable Turnover Rate	--	--	251	181.7	87.02

By analyzing the operating capability indicators of Beidahuang Group, the inventory turnover rate increased from 0.418 in 2018 to 14.13 in 2020. Although the cost of sales increased, the decrease in inventory quantity indicates a decline in agricultural production capacity due to economic influences. The total asset turnover rate remained stable over the past five years, consistent with the industry's average level. The accounts receivable turnover rate steadily improved, rising from 87.02 to 251 days, potentially due to increased sales revenue and a more urgent collection of accounts receivable. Overall, Beidahuang Group has shown good agricultural production efficiency over the past five years, with steady development and enhanced comprehensive operational strength. Therefore, based on the horizontal and vertical analysis of the annual report data regarding the operating, debt-paying, and liquidity abilities of Beidahuang Group, it can be concluded that the company has shown favorable development trends over the past five years and holds a leading position in the provincial industry.

4. Heilongjiang Modern Agricultural Industry Development Strategies and Practical Choices

4.1. Food Security Strategy

The production and security of food are the cornerstone of the development of Heilongjiang Province's real economy and an important path for people's lives to move towards prosperity. Internally, although Heilongjiang has always attached great importance to agricultural production and development, there are differences in the environmental conditions within the province, with uneven distribution of natural resources, and a lack of awareness of industrialization and clustering of agricultural production. These factors have to some extent hindered the development of the agricultural industry in Heilongjiang. Externally, as a major grain-producing province, Heilongjiang faces fierce competition in the external market, with American food company Bunge and French food group Dafengmai continuously entering the Chinese grain market, which puts pressure on the local grain market in Heilongjiang. Therefore, the development of the agricultural industry first guarantees food security, strictly implements the joint responsibility of the Party and the government, and clarifies the responsibility for food security. Secondly, maintaining or reducing the price for rice farmers, relaxing grain planting subsidy policies, and actively controlling various aspects of major grain production to eliminate waste of finished products and resources, ensuring stable grain production in Heilongjiang and driving the industrial chain of enterprises in the province.

4.2. High-Tech Agricultural Technology Strategy

The rapid development of the agricultural industry relies on high-quality agricultural technology. In Heilongjiang Province, rice, soybeans, livestock farming, and forestry have always been the main agricultural industries. However, there is a relative lag in technological equipment and a lack of core technology research and development, with single germplasm resources and high production costs. To address these issues, we need to have an in-depth understanding of the underlying needs of the agricultural industry and promote core technological breakthroughs in picking, animal husbandry, and new grain production. At the same time, the use of the national satellite intelligent network inspection system and advanced agricultural machinery and equipment for comprehensive control of agricultural development in terms of production, transportation, and sales to improve work efficiency. Introducing high-tech agricultural technology helps transform the research achievements of local researchers and significantly reduce related costs, which has significant benefits for Heilongjiang's economy and the environment.

4.3. Ecological and Environmental Protection Strategy

Heilongjiang Province is an area with large agricultural output, but during this process, excessive use of fertilizers and pesticides by farmers has posed a threat to the agricultural environment. In addition, there are issues of waste and backwardness in the agricultural environment. To address these problems, we need to test and sample heavy metals and corporate wastewater in Heilongjiang Province, strictly supervise and implement corporate environmental emission standards, and actively protect the interests of farmers. We should also strive to reform the environmental compensation system to improve the efficiency of agricultural production and agricultural technology resources and transform the management and operation of the agricultural industry. At the same time, we should actively reduce carbon emissions, increase agricultural foreign exchange income, promote the healthy, green, long-term, and coordinated development of agriculture in Heilongjiang Province.

4.4. Income Growth Strategy

The agricultural output value in Heilongjiang Province has reached 671.824 billion yuan, ranking fifth among all provinces in China. This includes animal husbandry, small-scale fisheries, and small-scale livestock farming. Agricultural income is the main driving force for farmers to engage in agricultural production and other activities. In recent years, our province has issued a series of agricultural support policies to support the operation of agriculture and related enterprises and protect the interests of farmers. At the same time, reforming the operation mode of agricultural organizations, improving the professional skills of professional farmers, and making them more specialized and new-type farmers. We should also optimize the rural industrial structure, deepen the planting of high-value agricultural crops, animal husbandry, and aquaculture industries, and further promote the growth of industry income.

4.5. International Trade Strategy

With the arrival of the 21st century, the world economy is developing rapidly, and cooperation between countries has become closer. Cooperation and competition coexist. Harbin, Mudanjiang, and Suifenhe in Heilongjiang Province, as border cities and important nodes, are connected with Vladivostok in Russia. Additionally, Suifenhe has established an international free trade zone. For a country like Russia, which has highly developed heavy industries and relatively simple light industries, our province has unique geographical and product advantages, exporting large quantities of rice, soybeans, vegetables, and daily necessities to Russia. At the same time, the province has implemented policies of reduced import and export tariffs for agricultural enterprises, further stabilizing international exchanges and the economic and trade environment within the province. This ensures free trade while reducing market

risks for external goods, effectively reducing risks in agricultural operations and trade, and increasing employment opportunities for local labor, achieving a win-win situation.

5. Policy Recommendations

In terms of support and assistance, the focus should be on reforming agricultural development and systems, promoting the development and guidance of professional skills, and providing tax and fee incentives for enterprises. Improve agricultural industry management through administrative reform to ensure the healthy and sustainable development of modern agriculture. Enhance farmers' professional knowledge and practical operational skills to better accept and apply high-tech scientific technologies. Mobilize the enthusiasm of primary industry enterprises, endow them with industrial capabilities, and attract large agricultural enterprises from other provinces to invest, supporting the advantageous industries of agriculture in Heilongjiang Province.

In terms of agricultural production and infrastructure development, research and develop intelligent production facilities, actively invest in core infrastructure, and collaborate and experiment with agricultural technologies in other provinces across the country. Strengthen investigations in various regions of the province, conduct risk inspections, and collaborate with specialized institutions and third-party professional organizations to rapidly diagnose and solve "major agricultural industry risk issues". Better regulate the advantageous construction pattern of the provincial industrial development system.

In terms of environmental protection and carbon reduction, protect the natural and economic environments of industries, connect specific protection measures with carbon emissions and peak values. Link the protection of ecological environment with agricultural development, minimize the consumption of traditional energy and materials, promote the electrification and hydrogenation of industries, and reduce excessive emissions of carbon, sulfur, and other pollutants. Achieve targeted environmental protection goals to ensure targeted and non-blind protection of industrial ecological environments.

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