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Research on the Cost-Benefit Comparison of Cotton Production between China and the United States

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Abstract

This study analyzes the cost and benefit dynamics of cotton production in China and the United States, identifying their changing characteristics and evolutionary patterns, and elucidating the differences between the two nations. The research findings indicate the following: firstly, Chinese cotton production is characterized by high costs and high returns, with production costs increasing annually and returns experiencing significant fluctuations, primarily driven by labor factors. In contrast, U.S. cotton production is marked by lower costs and returns, which remain relatively stable, influenced mainly by technological and capital investments. Secondly, over the observation period, the input-output efficiency in cotton production for both China and the U.S. has seen a reversal, suggesting that China still trails behind the U.S. in this aspect. Thirdly, the disparities in cotton cost and benefit between the two countries are largely attributed to differences in natural resource endowments, social development conditions, policy implementation mechanisms, and the maturity of market mechanisms. Finally, recommendations are made to optimize the production cost structure, strengthen the agricultural policy support framework, enhance the precision of policy execution, adjust and refine agricultural policies in a timely manner, stabilize the prices of agricultural inputs and outputs, and foster the high-quality development of the cotton industry.

Keywords: Cotton industry; Cost-benefit; High-quality development

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1. Introduction

China is currently in a critical period of transitioning from an agricultural powerhouse to a modern agricultural leader. In recent years, China's agricultural development has faced challenges such as rising labor costs and the reconfiguration of agricultural resources. At the same time, with the comprehensive promotion of the rural revitalization strategy and the acceleration of agricultural and rural modernization[1], Chinese

agriculture needs to establish a modernization transformation and upgrading path that aligns with national conditions[2], contributing to the achievement of the "dual carbon" goals. Given this context, the high-quality development of Chinese agriculture is particularly important and urgent.

To address these challenges and achieve high-quality development, Chinese agriculture can promote the organic connection between small farmers and modern agricultural development[3], foster a new rural economy, and achieve sustainable industrial growth[4]. By learning from the development experiences of countries with advanced agricultural practices, China can aim for "overtaking on the bend." The United States, as one of the leading agricultural nations globally, has made significant strides in modernizing agriculture[5], achieving notable results in sustainable agricultural technology innovation, the integration of industry, academia, and research[6], the cultivation of professional farmers[7], and the enhancement of agricultural risk management policies[8]. Drawing on the beneficial experiences of agricultural development in the United States and adapting them to China's specific national conditions can provide strong references and support for the modernization and high-quality development of Chinese agriculture.

Cotton is not only an important economic crop but also a fundamental raw material for the textile industry, influencing the development and security of both agriculture and industry. It is one of the representative crops in agriculture, and the high-quality development of the cotton industry is a crucial component of the overall high-quality development of agriculture. China and the United States are significant cotton-producing countries, with their combined production accounting for over 30% of the global total. The cotton industries in both countries are comparable in scale and characteristics[9].

At the beginning of this century, scholars explored the comparative advantages of Chinese cotton from an international competition perspective by analyzing the cost-benefit dynamics between China and the United States[10]. Since joining the World Trade Organization (WTO), and after more than 20 years of global competition, China's cotton industry has become an essential part of the global cotton industry chain. Particularly following the implementation of the cotton target price reform policy, it has achieved comprehensive development, and its cost-benefit dynamics have undergone significant changes. Meanwhile, the United States continually adjusts its cotton industry policies to respond to shifts in international competition, resulting in new characteristics in its cotton cost-benefit ratio.

In this context, it is essential to explore several key issues: What changes have occurred in the cost-benefit analysis of cotton between China and the United States? What are the causes of these differences? Has the country made corresponding adjustments to the cost structure of the cotton industry? Have these adjustments achieved the expected effects? Did any new issues arise during the adjustment process? Addressing these questions can provide a deeper understanding of the development trends in the cotton industry and guide the formulation and implementation of subsequent industrial policies.

Although domestic scholars have conducted some research on the cost-benefit changes of cotton in Xinjiang in recent years, there remains a relative lack of comparative research on the cost-benefit dynamics of cotton between China and the United States. Furthermore, few studies have explored the high-quality development of the cotton industry from a cost-benefit perspective. To fill this research gap, this article selects relevant data on the cost-benefit of cotton in China and the United States from 2002 to 2021, compares and analyzes the cost-benefit characteristics of the cotton industries in both countries, and explores their temporal evolution. The aim is to provide robust data support and policy recommendations for the high-quality development of China's cotton industry in the new development stage, thereby enhancing the overall competitiveness and sustainable development capacity of China's cotton industry.

2. Cost benefit characteristics of cotton in China and the United States

In this study, the cost-benefit data for Chinese cotton was sourced from the "Compilation of National Agricultural Product Cost and Benefit Data," compiled by the Price Department and Price Cost Survey Center of the National Development and Reform Commission of China. The cost-benefit data for cotton in the United States were obtained from relevant reports of the Economic Research Service of the United States Department of Agriculture. The exchange rate data was sourced from the World Development Indicators (WDI) database

provided by the World Bank, calculated based on the annual average exchange rate. All data are measured in Chinese CNY, hectares, and kilograms.

To analyze cotton production costs in more detail, this study systematically classified and deconstructed cost data, specifically dividing them into labor costs, land costs, material costs, machinery costs, and other costs. The separate listing of machinery costs is to more accurately evaluate the development level of mechanization in cotton production. Material expenses include seed fees, fertilizer fees, farm manure fees, pesticide fees, and agricultural film fees. Mechanical costs encompass rental operation fees, fuel and power fees, technical service fees, tool and material fees, and repair and maintenance fees. Other expenses that cannot be clearly classified under the aforementioned categories are uniformly categorized as other costs.

It is worth noting that there are differences in statistical indicators between China and the United States. In the U.S. data, land cost refers to the opportunity cost of land, while labor cost includes the imputed value of hired and household labor. Material expenses mainly comprise seed fees, fertilizer fees, and pesticide fees, whereas machinery expenses cover fixed asset depreciation, operating costs, fuel and power costs, and repair costs.

2.1. Current situation analysis

Comparative analysis indicates that Chinese cotton currently exhibits high cost and high return characteristics, while American cotton demonstrates low cost and low return characteristics. Specifically, as shown in Table 1, in 2021, the production cost per hectare of cotton in China was 3.66 times that of the United States, and the output income was 3.01 times that of the United States. This comparison reveals the significant high input and high output characteristics of Chinese cotton.

Xinjiang is the most important cotton-producing region in China, accounting for 89.50% of the country's total cotton production in 2021. By comparing the cost-benefit data of Xinjiang with the national average, it is observed that the production cost of cotton in Xinjiang is lower than the national average, while the output benefit is higher than the national average. The yield per unit area is 10.79% higher than the national average, indicating that the development of Xinjiang's cotton industry is leading within the country.

Further comparison of the cost-benefit situation of cotton between Xinjiang and the United States shows that Xinjiang's cotton production costs and output benefits are both higher than those of the United States, exhibiting the characteristics of high input and high output. However, when comparing the profit-to-cost ratio of cotton, it was found that China's is about 30 percentage points lower than that of the United States, and Xinjiang's is nearly 10 percentage points lower than that of the United States. This indicates that there is still room for improvement in China's cotton input-output efficiency compared to the United States.

Table 1 Cost Benefit Status of Cotton in China (Xinjiang) and the United States in 2021

	Unit area production costs (CNY/Ha)	Unit yield production costs (CNY/kg)	Unit area profit (CNY/Ha)	Unit yield profit (CNY/kg)	Revenue cost ratio	Unit area yield (kg/Ha)
China	36366.45	19.53	50020.2	26.87	1.38	1861.65
Xinjiang	35729.25	17.32	56299.95	27.3	1.58	2062.5
U.S.	9934.35	9.05	16631.1	15.14	1.67	1098.3

Based on the current analytical framework, this study further deconstructs the production costs of cotton. The research findings reveal significant differences in the composition of cotton production costs between China and the United States. Specifically, as shown in Table 2, in 2021, the production cost of cotton in China was dominated by labor costs, while the Xinjiang region exhibited a relatively balanced development characteristic. In contrast, cotton production in the United States is more driven by technology and capital factors.

In terms of the proportion of cost input, China's cotton labor and land costs are 32 and 5 percentage points higher, respectively, than those in the United States, while material and machinery costs are 15 and 23 percentage points lower, respectively, than those in the United States. This indicates that in current cotton production in China, labor and land inputs account for a relatively high proportion, and there is still a significant gap compared to the United States in terms of technology application and capital investment.

Comparing the current situation of cotton cost composition between China and the United States, and considering social development trends and China's agricultural industry transformation policies, it can be concluded that there is room for adjustment in the cost structure of cotton.

Table 2: Production Costs and Composition of Cotton in China and the United States in 2021 (Unit: CNY/Ha)

Production cost		Labor cost		Land cost		Material cost		Machinery cost	
China	U.S.	China	U.S.	China	U.S.	China	U.S.	China	U.S.
36366.45	9934.35	14321.70	701.55	6988.05	1370.85	7306.95	3448.65	6187.95	3972.75

2.2. Time-varying feature

As shown in Figure 1, the production cost of cotton in China has exhibited a continuous upward trend, but the growth rate has experienced a pattern of initial increase, subsequent decrease, and eventual stabilization. Between 2002 and 2021, the production cost per unit area of cotton in China increased by 26,796.45 CNY/Ha, marking a growth rate of 257.61% and an average annual growth rate of 6.90%. In contrast, the overall change in cotton production costs in the United States during the same period was relatively minor, with an increase of only 248.40 CNY/Ha, indicating a comparatively stable cost control capability.

The growth trend of cotton production costs in China can be segmented into several phases. From 2002 to 2009, the reform of the cotton circulation system refined the market mechanism, invigorated farmers' enthusiasm for planting cotton, and led to an expansion in cotton planting area and productive investment. From 2010 to 2013, volatility in the international market impacted the domestic market, with cotton prices remaining high. Concurrently, abrupt changes in market conditions and incomplete market information prompted cotton farmers to continually increase their productive inputs, resulting in an average annual growth rate of 17.78% over these four years.

In 2014, Xinjiang initiated the implementation of the cotton target price reform policy, which provided an annual reference for cotton farmers' production input decisions by publishing guiding prices, effectively curbing the growth of cotton production costs. Between 2014 and 2021, the average annual growth rate of cotton production costs decreased to 1.35%, indicating a significant deceleration in cost growth following the policy's implementation. This policy has mitigated and controlled the risks associated with market cotton price fluctuations by establishing a reasonable purchase price, eased the situation of farmers continuously expanding their investments, and contained the overall cotton production cost within a reasonable range, safeguarding the economic interests of farmers.

The implementation of the cotton target price reform policy not only stabilizes production costs but also incentivizes farmers to enhance production efficiency by increasing yields and reducing yield costs, thus fostering the high-quality development of China's cotton industry to a certain extent. In contrast, due to the advanced level of cost control in the United States, the stability of cotton planting costs per unit area is higher than in China. The lower production costs significantly bolster the bargaining power of American cotton in the international market, offering robust support for its competitiveness on the global stage.

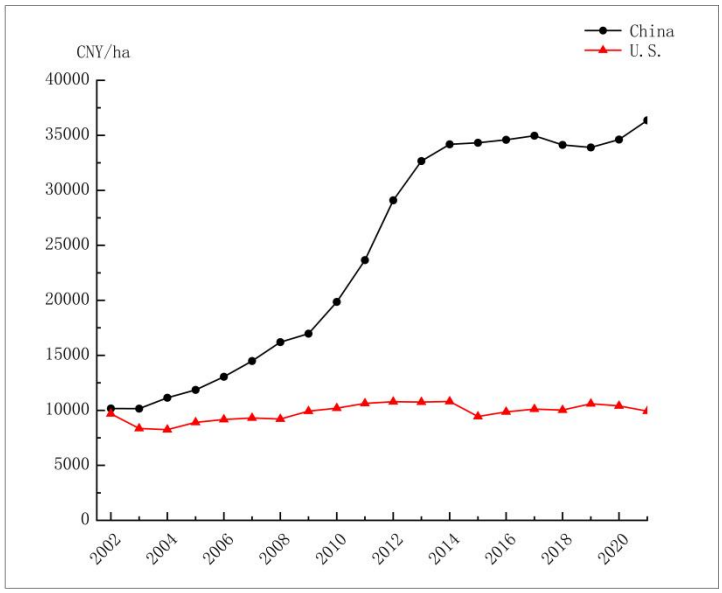

Figure 1 Production cost per unit area of cotton in China and the United States from 2002 to 2021

Observing Figure 2, it can be seen that China's cotton yield exhibits significant volatile growth characteristics, reflecting both market volatility and policy adaptability. In contrast, cotton yields in the United States have shown a gradually stable trend, with influencing factors shifting from a single market impact to a dual role of market and policy.

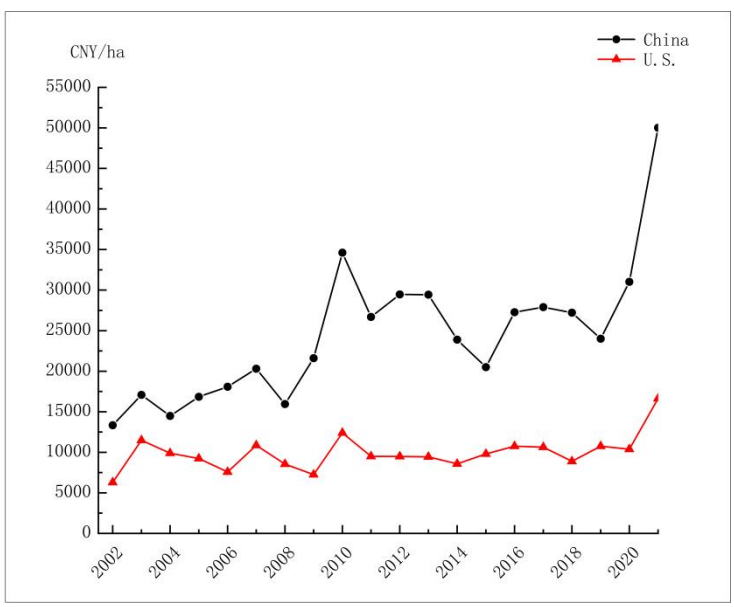

Figure 2: Cotton Unit Area Revenue in China and the United States from 2002 to 2021.

Specifically, the overall yield per unit area of cotton in China shows a fluctuating growth trend, with abnormal changes occurring at several specific time points. From 2009 to 2010, due to interference from the

international market, domestic cotton prices soared, resulting in a significant increase in cotton revenue. Over these two years, the total increase was 18,668.40 CNY/Ha, with year-on-year growth rates of 35.44% and 60.26%, respectively. From 2014 to 2015, the implementation of the cotton target price reform policy and the fluctuations in market cotton prices during the policy adaptation period led to a decrease in cotton revenue, resulting in a total reduction of 8,934.45 CNY/Ha over two years. From 2020 to 2021, the rise in cotton prices in both international and domestic futures markets was transmitted to the domestic spot market, resulting in a significant increase in cotton profits. Over the past two years, the total increase was 26,007.90 CNY/Ha, with year-on-year growth rates of 29.18% and 61.25%, respectively. Although the yield per unit area of cotton in the United States is also showing an increasing trend, compared to China, its volatility is relatively small and is gradually tending to stabilize. From 2002 to 2010, the yield per unit area of cotton in the United States experienced significant fluctuations, with substantial increases in 2003, 2007, and 2010, with year-on-year growth rates of 82.47%, 43.49%, and 71.00%, respectively. From 2011 to 2020, the magnitude and degree of changes in earnings were smaller than in the previous decade.

By comparing the fluctuations in cotton yields between China and the United States, it is evident that the volatility of cotton yields in China is more severe than that in the United States, with a magnitude and degree of change more than three times that of the United States. Specifically, in both 2010 and 2021, there was a significant increase in cotton yields in China and the United States. However, due to effective policy responses to market changes, the impact in the United States was lower than in China. Specifically, the change in China's cotton revenue in 2010 was 2.08 times that of the United States, while in 2021 it was 2.56 times. The Chinese cotton market is more sensitive to price changes. Although this may increase the income and planting enthusiasm of some cotton farmers in the short term, in the long run, such high volatility is not conducive to the stable development of the cotton industry and the smooth operation of the industrial chain.

In economic research, the absolute value of cost-benefit may vary due to differences in economic development levels, industrial structures, policy environments, and other factors between countries. Therefore, the cost-benefit ratio is often used as an important indicator to measure the efficiency and effectiveness of industrial development.During the observation period, there was a significant difference in the profit-cost ratio of cotton between China and the United States. From 2002 to 2013, the profit-cost ratio of cotton in China was higher than that in the United States but with greater volatility. During this period, the Chinese cotton industry showed high market profitability but also exposed instability in cost control. From 2014 to 2020, the situation reversed, with China's cotton yield cost ratio lower than that of the United States, showing a relatively stable trend. Specifically, from 2014 to 2020, the average annual profit-cost ratio of cotton in China was 0.75, while in the United States it was 0.98. This means that for every 100 units of input cost, the yield of cotton production in China is 75 units, while in the United States, cotton can produce 98 units. The profit-cost ratio of cotton between China and the United States differs by nearly 23 percentage points, which is particularly prominent in international cotton industry competition.

Further analysis of the changes in cost-benefit analysis reveals that the significant increase in cotton production costs in China from 2010 to 2013 was the direct cause of the reversal in the cost-benefit ratio. Although the trend of cost growth has been curbed since 2014, the profit-cost ratio of cotton is still lower than that of the United States, reflecting the challenges faced by China's cotton industry in cost management and revenue improvement. This may be related to multiple factors. At the same time, in order to gain a deeper understanding of the reasons for the difference in the profit-cost ratio of the cotton industry between China and the United States, and to explore the direction of adjustment for the Chinese cotton industry, a detailed analysis of the composition of production costs is also needed. This includes in-depth exploration of various cost elements such as labor costs, land costs, material costs, and machinery costs. Through this comprehensive analysis, a scientific basis can be provided for the policy-making, strategic planning, and risk management of China's cotton industry, promoting the stable development of the industry and enhancing its international competitiveness. At the same time, this also helps to reveal the position and potential of China's cotton industry in the global cotton market, providing strategic support for achieving sustainable and high-quality development.

3. Cause analysis

The cost-benefit disparity between China and the United States in cotton production can be attributed to multiple factors, and a detailed analysis of several key aspects is provided below.

Firstly, there are differences in natural resource endowments. According to the World Bank, in 2021, the per capita cultivated land area of the United States will be six times that of China, while China's population size is more than four times that of the United States. This significant imbalance in the land-to-population ratio has profoundly impacted the agricultural development models of the two countries. To meet the market demand driven by its large population, China's agricultural sector has adopted a high-input, high-output production model. This model increases output per unit area by intensifying the input of agricultural resources such as labor, capital, and technology, ensuring that the basic subsistence needs of the population are met and providing necessary raw material support for industrial development. This development path is the result of the combined effects of China's unique resource conditions and social needs. In contrast, the United States, with its vast per capita arable land area and relatively abundant agricultural resources, can achieve higher output with lower input per unit area. This resource endowment advantage allows American agriculture to meet the demands of domestic and international markets while maintaining cost-effectiveness. Further analysis reveals that while the high-input, high-output model of Chinese agriculture can ensure the supply of agricultural products in the short term, it may face risks of excessive resource development and increased ecological pressure in the long run. Therefore, the sustainable development of Chinese agriculture requires attention to improving resource utilization efficiency while ensuring food security and agricultural product supply, and promoting the high-quality development of agriculture towards more intensive, efficient, and environmentally friendly directions.

Secondly, there is the impact of social development status. As a developed country with mature industrial technology and a market-oriented competitive mechanism, the United States has the advantage of mature technology and diversified products in the production of material inputs, including seeds, fertilizers, pesticides, and agricultural machinery. These factors collectively contribute to the stability of prices in the U.S. agricultural market, and the costs and benefits of cotton production in the U.S. also exhibit high stability. As a developing country with a relatively weak industrial foundation, China faced challenges in the early stages of development due to immature technology and dependence on imported products in terms of material resources. The early agricultural development in China was constrained by technological and product import restrictions, coupled with inflation brought about by rapid economic growth and the vulnerability of emerging market economies to external shocks. These factors combined led to the sustained high operation of agricultural production costs in China and the instability of agricultural product market prices. With the continuous growth of the Chinese economy and the continuous progress of industrial technology, China has significantly narrowed the gap with the international advanced level, gradually reduced its dependence on foreign technology and products, and enhanced its self-sufficiency in domestic production materials. With the gradual improvement of market mechanisms and the enhancement of market regulation capabilities, China has gained more market initiative, reduced the impact of external shocks on the domestic market, and reduced the fluctuation range of material and agricultural product market prices. These changes are reflected in the cotton industry, manifested as the increasing stability of China's cotton production costs and benefits. Although China's cotton industry still faces many challenges, with the deepening of market-oriented reforms and continuous optimization of industrial policies, the cost-benefit structure of China's cotton industry is gradually developing towards a more stable and predictable direction. This trend is not only of great significance for ensuring the security of domestic cotton supply but also plays a positive role in enhancing the international competitiveness and market adaptability of China's cotton industry.

Thirdly, there are differences in policy implementation mechanisms. From 2002 to 2011, the average annual production cost of cotton in China was 0.42 CNY/kg lower than that in the United States, and the difference in cotton production costs between the two countries was not significant. Chinese cotton had a certain competitiveness in the international market. At that time, China's agricultural development followed the international market order, and the pricing power of agricultural production material imports and

agricultural product exports was mainly controlled by developed Western countries led by the United States. However, the severe fluctuations in international cotton prices in 2012 impacted the domestic market in China, leading to drastic changes in domestic cotton prices, seriously disrupting market order, and affecting the stable development of the industry. Due to its massive industrial scale, China's agriculture has actually formed a complete industrial chain system. To protect the relatively weak cotton industry and ensure the overall smooth operation of the cotton textile and clothing industry chain, China has implemented a series of cotton protection measures, transferring some of the costs of cotton production to the middle and back ends of the industry chain and dispersing risks to the downstream links of the cotton industry chain. On the other hand, the main purpose of cultivating crops in the United States is for export, and a complete industrial chain system has not yet been formed. Therefore, there is no mechanism for transferring and compensating costs in the industrial chain in the United States. This difference further widens the gap in cotton production costs between China and the United States. This difference actually reflects the different focus of agricultural policy regulation between the two countries. China's agricultural policy primarily aims to maintain the stability of the planting area and yield of agricultural products, safeguard the basic income of farmers, and maintain regional stability and development security. Therefore, the policies formulated by China aim to reasonably guide the coordinated development of the industrial chain, maintain market stability, and continuously explore and improve in the implementation process to better fit China's national conditions. The focus of U.S. agricultural policy is to enhance the international competitiveness of agricultural products, promote agricultural exports, increase the income of farmers, and maintain the monopoly position of U.S. agriculture in the international market. To achieve these goals, the United States fully utilizes international rules to create trade facilitation for agricultural products and utilizes fluctuations in international market agricultural product prices to increase domestic agricultural product returns. The United States continuously enhances the international competitiveness of agricultural products through the coordination and complementarity of international and domestic agricultural policies. The difference in cost-effectiveness of the cotton industry between China and the United States not only reflects the differences in agricultural policy implementation mechanisms between the two countries but also reflects their strategic choices in agricultural development goals and market positioning.

Fourthly, there are differences in the degree of perfection of market mechanisms. From China's accession to the WTO in 2001 to the implementation of the cotton target price policy in 2014, the Chinese cotton market underwent significant changes. On the one hand, with the rapid development of downstream industrial chains such as the textile and clothing industry, the demand for cotton has sharply increased, leading to an annual increase in cotton imports. On the other hand, the fluctuation of cotton planting area in China is severe, with the maximum difference between years approaching 1,000 thousand hectares and the difference between extreme years exceeding 1,700 thousand hectares. This instability has led to uneven cotton production. Especially in 2010, the severe fluctuations in international cotton prices significantly impacted the domestic market, resulting in China's cotton imports reaching 5.13 million tons in 2012, a year-on-year increase of 1.77 million tons, or 52.68%, which is close to 80% of domestic cotton production. The massive influx of international cotton has seriously squeezed the domestic market and posed a huge challenge to domestic cotton farmers. If there is no government intervention, the interests of cotton farmers will face extremely high risks, and the instability of cotton production may further affect the development of the entire cotton textile and clothing industry chain. In addition, if the market heavily relies on imported cotton, the security of the raw material supply chain will face severe challenges. In extreme cases, if international organizations such as the United States impose restrictions or sanctions on cotton exports, China's cotton textile and clothing industry chain may face the risk of short-term disruption, which may to some extent align with the strategic expectation of the United States to maintain its agricultural monopoly interests. Stability is a prerequisite for development. In order to ensure the basic income of cotton farmers, maintain social stability, and ensure the stability of raw material supply to support the sustainable development of the industrial chain, China has implemented a policy of target price reform for cotton. This policy addresses market failure through subsidies. The United States has a long and strong history of policy support for agriculture. Since the enactment of the Agricultural Adjustment Act in 1933, the United States has enacted a total of 19 new laws and made nearly 40

adjustments until 2017. In 2018, the introduction of the Agricultural Enhancement Act further strengthened the protection of agriculture. The challenges faced by China's cotton industry in the process of marketization, as well as the long-standing agricultural protection policies of the United States, indicate that a simple market mechanism is not sufficient to ensure the stable development of the country's agriculture.

4. Suggestions

Based on the above research, this article proposes the following strategies to promote the high-quality development of China's cotton industry.

Firstly, optimize the production cost structure. Currently, there is a disparity between the profit-cost ratio of Chinese cotton and that of the United States, primarily due to higher production costs in China. It is recommended to continue promoting the upgrading of the cotton industry and optimizing the production cost structure. By comparing and analyzing the cost composition characteristics of the cotton industry in China and the United States, it can be seen that replacing manual labor with agricultural materials and machinery is a feasible way to optimize the production cost structure. The Chinese cotton industry can learn from this experience and gradually achieve modernization and technological advancement in production materials. With the implementation of the cotton target price reform policy, the Chinese cotton industry is actively promoting the adjustment of the cost structure. Policy formulation and implementation should be coordinated with the feasible path of the U.S. cotton industry, while considering China's unique socio-economic background, focusing not only on economic benefits but also on social benefits. Considering the differences in agricultural planting patterns between China and the United States, the starting point of China's agricultural policies should be different from that of the United States, especially in terms of labor cost substitution. It is suggested to develop a phased plan to control the extent of labor cost substitution, ensure stable income for farmers, maintain social stability, and achieve sustainable and high-quality development of China's cotton industry.

Secondly, strengthen the policy support system for the agricultural industry and enhance the precision of policy implementation. The active support of U.S. agricultural policies and the practical experience of market-oriented development of China's cotton industry both indicate that agriculture, being a relatively weak industry, may be hindered in its development if it overly relies on market competition. Given the importance of agricultural products for national security and stability, the government should ensure the safety and stability of agricultural product supply through policy support. The implementation results of the cotton target price reform policy indicate that while the policy has achieved certain results in controlling cost growth, there are shortcomings in promoting revenue growth and resisting external shocks. This may be due to imprecise policy-making and implementation processes, as well as the tendency for cotton farmers to increase costs and expand production due to guaranteed minimum prices. Therefore, it is necessary to further deepen and improve the cotton target price reform policy to achieve more precise market regulation and subsidy allocation. When formulating new agricultural policies, the impact of international trade agreements should be fully considered. In the current international trade agreements dominated by the WTO Agreement on Agriculture, core provisions such as market access and domestic support are mainly led by countries like the United States. These provisions are beneficial to the development of American agriculture to a certain extent, while there are many restrictions on the development of Chinese agriculture. Therefore, in the process of formulating new policies, on the one hand, compatibility with international trade agreements should be considered, and on the other hand, in combination with the current international situation of prevailing international trade protectionism, on the basis of adhering to the principle of openness and inclusiveness, we should explore the establishment of a more mutually beneficial and win-win international order and new agreements.

Thirdly, adjust and optimize agricultural policies in a timely manner to address new challenges in the agricultural sector. One of the core issues for high-quality agricultural development is supply-side structural reform, and one of the key links of this reform involves the adjustment of the production cost structure, which has achieved initial results. However, new problems may arise during the policy implementation process.

Taking the cotton target price reform policy implemented in 2014 as an example, its trial has triggered some new challenges. Especially the cost of land and its contribution to the total cost continue to rise, with the growth rate further expanding after 2017. Firstly, Chinese farmers generally have a traditional "land complex," which to some extent strengthens the value recognition of land. Secondly, the implementation of the policy of "separation of three land rights" has released a signal to promote land circulation, combined with the limited availability of arable land resources, further pushing up land circulation prices. The rapid increase in land transfer prices may hinder the sustainability and high-quality development of agriculture. To effectively address this issue, the following measures are recommended: Firstly, a land classification system can be implemented based on the soil requirements of different crops and the quality standards of agricultural products. Secondly, standardize based on the specific situation of regional land costs to ensure that land transfer prices are maintained within a reasonable range. Through meticulous policy design and precise implementation, it is possible to promote the rational allocation of land resources, better drive supply-side structural reform, and achieve sustainable and high-quality development of the cotton industry.

Fourth, maintain the stability of agricultural production materials and cotton market prices. From the perspective of the cost-benefit performance of cotton in the United States, stable agricultural production material prices can effectively control production costs, while stable cotton prices can effectively guarantee the income of cotton farmers. Therefore, maintaining stability in these two aspects is an effective way to promote the high-quality development of the cotton industry. Currently, China is committed to building a unified national market. In this context, emphasis should be placed on establishing unified entry thresholds and supervision standards for agricultural production materials. By achieving transparency in the prices and quality of agricultural production materials, the smooth flow of production factor resources can be promoted, thereby forming a stable supply system for agricultural production materials. In addition, it is equally important to develop a floor price policy for crops that is compatible with the domestic agricultural and economic development situation, taking into account both the production cost of crops and the social cost of living. This policy needs to balance the interests of farmers and the well-being of consumers.

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