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# DEVELOPMENT OF AGRICULTURAL SECTOR IN CHINA: STRUCTURE, TRENDS AND INVOLVEMENT IN THE GLOBAL TRADE FLOWS

*The paper reveals the issues of agricultural development and trade in China for the period 2014-2022. The rapid growth in the output value of agriculture, forestry, animal husbandry, and fishery in China is marked, highlighting the distinctive advantages of regions specializing in these areas. It was found that despite using only 7% of its own arable land, China manages to feed 20% of the global population, achieving a 95% self-sufficiency rate in cereals. This study employs policy investigation and comparative analysis to assess the evolution of China's agricultural policies and their impact on the industry. The paper further explores the balance in the supply and demand of major crops like rice, wheat, and corn, and the substantial improvements in national food security. Additionally, the international trade of agricultural products has expanded, showcasing China's comparative advantages and efficient resource utilization. It identifies the achievements and challenges in China's agricultural development and emphasizes the importance of international cooperation and sustainable development strategies, such as the "Belt and Road" initiative, in enhancing global food security.*

***Keywords**: agriculture, rural development, periphery regions, agricultural trade, agricultural export and import, China, global product security*

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**Problem setting**. From 2014 to 2022, China has continued to promote the modern agricultural sector by formulating various policies and vigorously adjusting the structure of agriculture, forestry, animal husbandry and fishery. The intensification, scale and industrialization of agriculture, forestry, animal husbandry and fishery production have developed rapidly. As the output value scale of various industries continues to increase, different characteristics have emerged; the provinces where agriculture is concentrated have also displayed different advantages and characteristics. In order to facilitate sector forecasting, it is necessary to conduct agricultural development data research, discover industry development trends, and provide data support for formulating agricultural policies and adjusting industrial structure.

China uses 7% of its arable land to feed 20% of the world's population, of which the self-sufficiency rate in cereals reaches 95%. The supply and demand of the three major varieties of rice, wheat and corn are basically balanced, and the national food security has been significantly improved; production of feed crops increased significantly; animal husbandry and aquaculture developed more rapidly. Along with the steady growth of China's agricultural production, the international trade of agricultural products has grown rapidly. Especially after 2014, China's agricultural product trade structure has continued to change, with obvious agricultural comparative advantages, efficient resource utilization, and sustainable agricultural development. China is good at cooperation and exchanges and building a world community of life.

However, it should be emphasized that there are still many problems in agriculture in China and the world. With the population growth, nearly 800 million people worldwide are living in hunger, with the majority in sub-Saharan Africa. By 2050, 2 billion people will face hunger. In terms of its agricultural development strategy, China has actively learned from the world's advanced agricultural experience, made innovations, proposed the "Belt and Road" policy, and promoted and implemented sustainable development goals, which has attracted widespread attention from Chinese and foreign experts. Beverly Silver, a professor at the

Department of Sociology at Johns Hopkins University in the United States, said that international cooperation in the agricultural field will help countries establish sustainable development models, increase crop yields, and improve people's quality of life.

**Purpose.** The main purpose of the paper is to analyze the development of the structure of China's agricultural production to determine the state's achievements and shortcomings in the development of modern agriculture and it's involvement in the global trade flows.

**Methods.** This study mainly uses policy investigation, and comparative analysis methods to analyze the development of China's modern agriculture, forestry, animal husbandry and fishery from 2014 to 2022. At the same time, the development and changes in key agricultural products such as grain, cotton, oil, and sugar were analyzed. Through analysis, we will verify the necessity of China's formulation and adjustment of various policies in China.

**Results.** In China, agriculture is the primary industry, the most important and weakest sector in the national economy that is easily affected by various factors. Nevertheless, in recent years, China has used intelligent planting and breeding technologies, such as artificial intelligence, big data, Internet and other technologies, to achieve precise monitoring and automated control of the environment and processes, improving the output and quality of agricultural products using precision production technology, through genetic improvement, precision agriculture and other technologies to accurately manage and control the production of agricultural products. We are observing a great improvement in the efficiency of agricultural products through the adjustment of the industrial structure. The contradiction between imported agricultural products reduces the in-depth impact of foreign agricultural products on China. On the other hand, it proposes the concept of a world community of life, promotes agricultural cooperation between countries, improves the global agricultural industry chain and supply chain system, and contributes to world food security and balance (Du and Lishchynskyy, 2023; Shumin, 2017).

The evolution of the recent main strategic documents and policy tools to promote the development of agriculture in China is shown in Table 1.

According to the National Bureau of Statistics of China the total output value of China's agricultural products shows an overall steady upward trend. The total output value of China's agriculture, forestry, animal husbandry and fishery industry in 2022 was 15.61 trillion yuan, a year-on-year increase of 6.2%. Among them, agricultural output value accounted for 54.1%; animal husbandry output value accounted for 26.05%; fishery output value accounted for 9.91%; forestry output value accounted for 4.37% (Fig. 1).

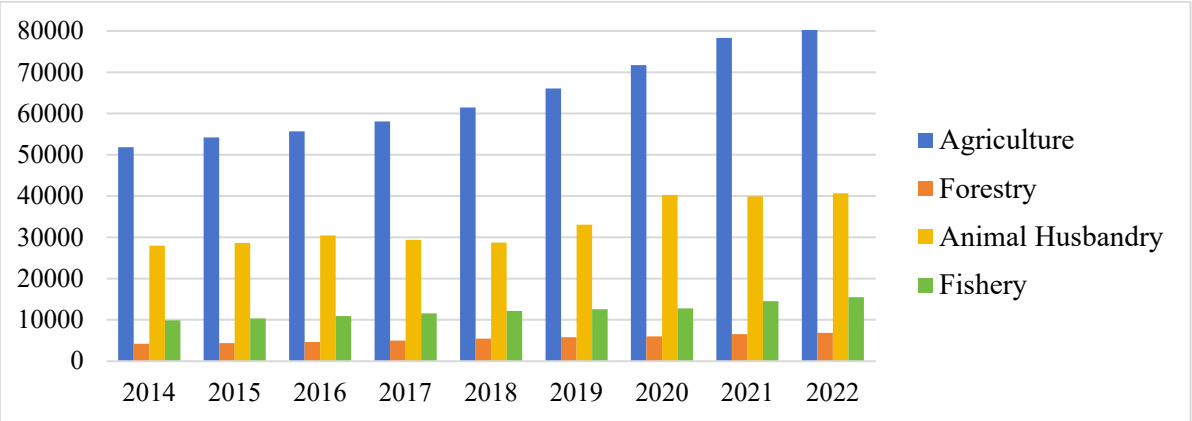


***Fig. 1*** *Gross Output Values of Agriculture, Forestry, Animal Husbandry and Fishery* (100 million yuan)

*Source: National Bureau of Statistics of China*

*Table 1*

**Some relevant policies for China's agriculture, forestry, animal husbandry and fishery industry**

| Year | Policy | Policy Interpretation |
|---|---|---|
| 2014 | "Several Opinions on Comprehensively Deepening Rural Reform and Accelerating Agricultural Modernization" | Respect the farmers' creations in some relevant policies and practices in China's agriculture, forestry, animal husbandry and fishery industries, promote the equal exchange of urban and rural factors and the balanced allocation of public resources, so that farmers can equally participate in the modernization process and jointly share the fruits of modernization. |
| 2015 | "Several Opinions on Increasing Reform and Innovation to Accelerate Agricultural Modernization" | Stabilize grain income and increase grain income, improve quality and efficiency, drive innovation, strive to tap new potential in improving grain production capacity, open up new ways to optimize agricultural structure, seek new breakthroughs in transforming agricultural development methods, and achieve new results in increasing farmers' income. |
| 2017 | "Several Opinions on Accelerating the Cultivation of New Motive Forces for Agricultural and Rural Development" | On the basis of ensuring national food security, improve the quality of agricultural supply, optimize the agricultural industry system, production system, and management system, increase land output rate, resource utilization rate, and labor productivity, and promote agricultural and rural development from over-reliance on resource consumption and mainly satisfying The demand for quantity has changed to the pursuit of green ecological sustainability and more emphasis on meeting quality needs. |
| 2019 | "Several Opinions on Adhering to Prioritizing the Development of Agriculture and Rural Areas and Doing a Good Job in "Three Rural Areas" | The government should give priority to ensuring capital investment in "agriculture, rural areas and farmers", insist on treating agriculture and rural areas as priority areas for fiscal protection and priority financial services, prioritize rural public services, and promote the unification of urban and rural basic public service standards and the integration of systems. |
| 2020 | "Several Opinions on Strengthening the Construction of Agricultural Science and Technology Socialized Service System" | Ensure stable and increased agricultural production, steady increase in farmers' income, and stability and tranquility in rural areas. Strengthen the rational allocation of agricultural structures such as agriculture, forestry, animal husbandry, and sideline fishery, and increase the planting of key agricultural products to ease the dependence on and restrictions on agricultural products in domestic and international markets. |
| 2021 | "Opinions on Comprehensively Promoting Rural Revitalization and Accelerating Agricultural and Rural Modernization" | Strengthen the protection, development and utilization of agricultural germplasm resources, accelerate the third survey and collection of crop germplasm resources, livestock and poultry germplasm resources, and strengthen the construction of the national crop, livestock, and marine fishery biological germplasm resource bank. |
| 2021 | "Implementation Plan for the Improvement of "Three Products and One Standard" in Agricultural Production" | Strengthen the construction of agricultural germplasm resource banks (fields, districts, and nurseries). Support a group of local characteristic varieties, and adopt technical measures such as variety selection, comparative experiments, original seed breeding, etc. for the improved varieties of crops and livestock such as soybeans, wheat, and pigs that are currently being promoted and used locally to accelerate the promotion of oil varieties. |
| 2021 | "Opinions on Further Strengthening Biodiversity Protection" | Continue to promote the investigation, cataloging and database construction of biological genetic resources and germplasm resources such as crops, livestock and poultry, aquatic products, forest and grass plants, medicinal plants, and fungi. |
| 2022 | "The 14th Five-Year Plan for Promoting Agricultural and Rural Modernization" | Improve the mechanized production system of crops throughout the entire process, accelerate the integration of varieties, cultivation, and equipment； implement the total marine fishery resource management system, improve fishing quota management and fishing moratoriums and bans, and continue to reduce the number of marine fishermen and switch to other industries. Strictly protect and manage precious and endangered aquatic wildlife and their habitats, severely crack down on illegal fishing, continue to carry out fishery enhancement and release, build marine ranches to high standards, and strengthen alien species prevention and control mechanisms. |
| 2022 | "Several Opinions on Promoting the Standardized, Healthy and Sustainable Development of the Platform Economy" | Encourage platform enterprises to innovate and develop smart agriculture, promote the digitalization of planting, animal husbandry, fishery and other fields, improve the digitalization level of agricultural production, processing, sales, logistics and other industrial chain links, improve the quality traceability system of agricultural products, and use branding and traceability to Help achieve high-quality and low-price agricultural products. |
| 2022 | "The 14th Five-Year Plan for Digital Economy Development" | Promote the intelligent transformation of agriculture, forestry, animal husbandry and fishery infrastructure and production equipment, and promote the application of machine vision, machine learning and other technologies. |

From the perspective of regional distribution of output value, Shandong, Henan, Sichuan, Hubei, and Guangdong are the top five provinces in China's total output value of agriculture, forestry, animal husbandry, and fishery, with output value proportions of 7.77%, 7.02%, 6.32%, 5.73%, and 5.70% respectively. From a comparison of the regional distribution data of agriculture, forestry, animal husbandry and fishery in 31 provinces in China in 2022, Henan, Shandong, Sichuan, Jiangsu, and Heilongjiang are the top five provinces in China's total agricultural output value, accounting for 8.23%, 7.35%, 6.55%, 5.55%, 5.12%. Guangdong, Guangxi, Yunnan, Hunan, and Anhui are the top five provinces in China's total forestry output value, with output value proportions of 8.05%, 8.04%, 7.22%, 7.00%, and 6.94% respectively. Sichuan, Shandong, Henan, Hebei, and Yunnan are the top five provinces in China's total livestock output value, accounting for 8.07%, 7.39%, 6.97%, 6.07%, and 5.88% respectively. Guangdong, Jiangsu, Fujian, Shandong, and Hubei are the top five provinces in China's total fishery output value accounting for 12.27%, 12.01%, 11.25%, 11.18%, and 10.24% respectively.

In 2022, the "crop sown area" in 31 provinces (autonomous regions and municipalities) across the country is about 113 million acres, with more than 60% distributed in 11 provinces Heilongjiang, Henan, Shandong, Sichuan, Anhui, Inner Mongolia, Hunan, Hubei, Hebei, Jiangsu, Yunnan. China's "crop sown area" is dominated by food crops – the proportion is close to 70%; the proportion of vegetable sown area is more than 10% all year round; the proportion of oil sown area is more than 5% all year round. Total Sowing situation of crops is shown in Fig. 2.

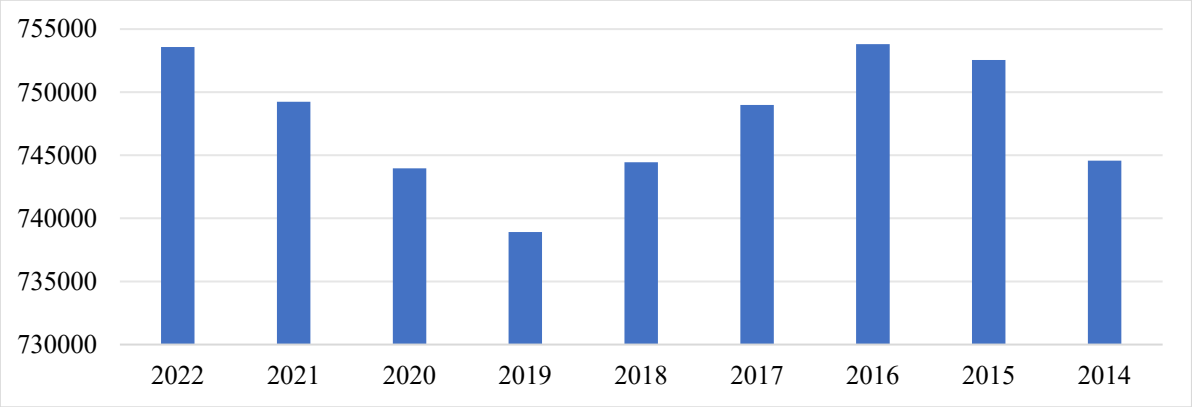


***Fig. 2.*** *Total sowing situation of crops* (10000 tons)

*Source: National Bureau of Statistics of China*

The structure of agricultural production is as follows:

*Grain output*: The country is based on agriculture, and food is the first priority for the people. Grain output has remained above 650 million tons in the past ten years, with little change in year-on-year data. In 2017, China's rice, wheat, and corn yields per acre were 50.1%, 55.2%, and 6.2% higher than the world average respectively.

*Rice*: China's total rice production has basically remained stable, with the basic data stable at more than 200 million tons. Specifically, the rice planting area will maintain a steady and slightly decreasing trend, and the yield per unit area will continue to increase. In 2022, the rice planting area will be reduced to 452 million acres, the yield will increase to 461 kg/acre, and the total output will reach 208.49 million tons.

*Wheat*: Wheat production is subject to agricultural resource and environmental constraints such as water and soil, and the wheat production area has been adjusted. The wheat planting area began to be proactively reduced in 2019, and will be adjusted to 235 million acres in 2022. However, the yield has further increased, reaching 362 kg/acre, an increase of 13

kg/acre compared with 2014. Wheat production continues to grow. At this growth rate, it is expected to reach 129.31 million tons in 2024, an increase of 2.5% over 2014.

*Corn*: In 2021, China's corn area has increased. The corn sown area for the whole year is 433 million acres, a year-on-year increase of 4.99%. However, drought has a greater impact on corn yield. In 2024, the corn area has decreased, and the yield per unit area is 388 kg/ acres, a year-on-year decrease. As an important food crop for the Chinese people, corn has significantly higher benefits than soybeans, miscellaneous grains and other crops. The corn planting area will increase on the basis of national macro-control. However, conflicts such as reduced cultivated land and lack of water resources determine the growth rate of corn area. Space is limited, and area growth will decrease or be negative in some years.

*Cotton*: China's cotton planting area and output can be seen to be declining year by year. China's cotton production layout is mainly concentrated in Xinjiang. Due to restrictions on the growth of textile exports and improvements in cotton substitutes, it is difficult for cotton to return to the 6.1028 million tons in 2018, and future development will be difficult to exceed the level of 10 million tons, basically forming a quantitative production level. At the same time, Chinese cotton is in line with the international market, and imported cotton substitutes such as polyester staple fiber and viscose staple fiber have effectively balanced the share and price of cotton in agricultural products.

*Oil*: From the statistical data, we can see that in 2014, China's oil and grease industry experienced a significant increase in oil imports and rising domestic prices. In the following years, the planting area of oilseeds in China increased steadily, and the yield per unit area increased steadily. From 2014 to 2022, farmers' output of soybeans increased by 50.27%, and that of peanuts increased by 15.27%. In the future, from the perspective of trend analysis, China will reasonably increase the area of planting other oil crops such as palm, peanut, corn, and sunflower, and promote the research and development of high-yielding and efficient oil crops.

*Sugar*: China's sugar crop planting area is small and its output is not high. China is currently the fourth largest sugar producer, the third largest consumer, and the largest importer in the world. Due to the restriction of high production costs, the output has basically remained at around 160 million tons in the past 10 years. At the same time, domestic sugar production enterprises are squeezed by imported sugar, and their profits are very low. Some sugar producers have reduced the planting of sugar crops and switched to planting high value-added cash crops. This has made the sugar contradiction increasingly serious. Therefore, China is the largest sugar producer. The status of importing countries will remain unchanged for a long time.

*Soybeans*: China's soybean planting area was only 7.097 million hectares in 2014. In 2022, China's soybean planting area will be 10.244 million hectares, an increase of 1.8287 million hectares from 2021, an increase of 21.7%. Affected by the Sino-US trade war, China has adopted government macro-control methods for soybean planting, carried out overall planning of soybean planting areas, and strictly implemented the soybean target price subsidy policy. As soybeans, an indispensable basic crop for China's agriculture, forestry, animal husbandry and fishery, China's future soybean production will remain stable and continue to increase, thereby easing dependence on imports and slowing down the growth of imports.

*Animal husbandry*: Animal husbandry production has grown steadily. In 2022, the total output value of pig, beef, mutton, and poultry meat will be 4.065236 billion yuan, an increase of 41.66% from 2018. Among them, the output of pork was 55.41 million tons, the output of beef was 7.18 million tons, the output of mutton was 5.25 million tons, the output of poultry was 24.43 million tons, the output of poultry eggs was 34.56 million tons, and the output of milk was 39.32 million tons. Judging from the trend, supply and demand are stable and development is stable (OECD-FAO, 2021).

China's trade in agricultural products remained relatively stable in 2023, reaching a total value of US$333.03 billion. This figure represents a slight year-on-year decrease of 0.4%,

indicating a continuation of previous trends. While overall trade dipped slightly, there were some interesting divergences between exports and imports. On the export front, China saw a modest increase of 0.9% year-on-year, reaching US$98.93 billion. This indicates the continued competitiveness of Chinese agricultural products in the global market. As a result, agricultural exports accounted for 2.9% of China's total foreign trade exports in 2023. In contrast, imports of agricultural products into China decreased slightly by 0.3% year-on-year, totaling US$234.11 billion. Despite the decrease, imports still hold a significant share, making up 9.2% of China's total foreign trade imports in 2023 (Fig. 3).

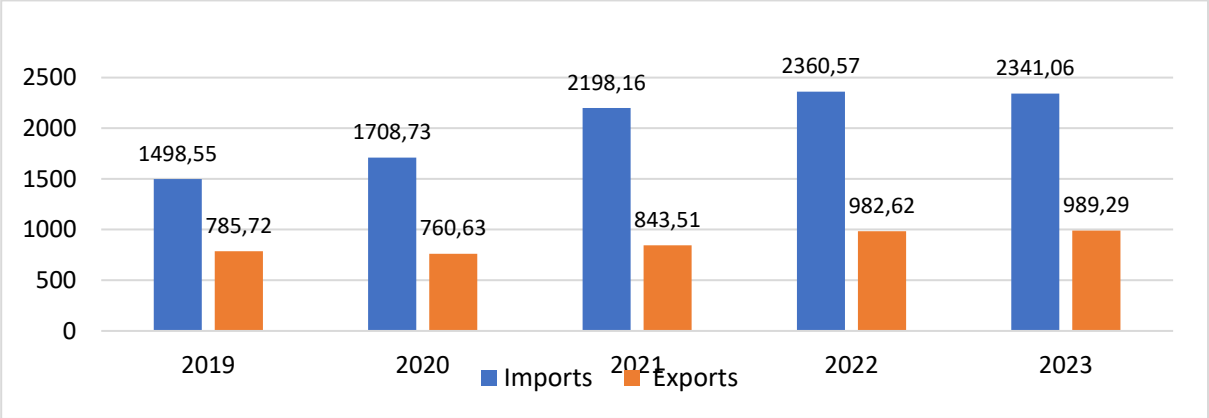


***Fig. 3.*** *China's import and export volume of agricultural products* (USD billion)

*Source: National Bureau of Statistics of China*

According to the "China Agricultural Outlook Report (2024-2033)", with the development and improvement of China's modern agriculture fully implemented nationwide in 2023, the comprehensive capabilities of China's agricultural industry will continue to be stable in the next ten years starting from 2024 promote.

Analyzing the future development trend of China's agriculture based on 2014-2022 data we could mark the following tendencies:

(1) *Focus on key industries of planting industry*. Nearly 30% of China's grain is distributed in Heilongjiang, Henan and Shandong, more than 70% is autumn grain, and more than 80% is cereals; about 8% of the area of vegetables is in Henan, and more than 10% of the output is in Shandong; nearly 50% of oil crops are distributed in Sichuan, In Henan, Hubei and Hunan, more than 50% of the area is rapeseed, and more than 50% of the output is peanuts; more than 30% of the medicinal material sowing area is distributed in Hubei, Gansu, Yunnan and Shaanxi; more than 80% of the cotton is distributed in Xinjiang; the green fodder sowing area is 30% More than 50% of the sugar is distributed in Xinjiang and Inner Mongolia; more than 55% of the sugar is distributed in Guangxi, and about 90% is sugar cane; about 40% of the tobacco is distributed in Yunnan, and about 95% is flue-cured tobacco; more than 60% of the hemp is distributed in Heilongjiang and Sichuan; tea 30 More than % are distributed in Yunnan and Fujian, and more than 65% are green tea; more than 20% of the fruits are distributed in Guangxi and Shandong, and about 70% are garden fruits.

(2) *Developing of key production areas for planting industry.* Shandong is the province with the highest gross output value of agriculture, forestry, animal husbandry and fishery in the country. The gross agricultural output value is second only to Henan. The production scale of grain, vegetables and fruits ranks among the top three in the country. Henan is the province with the highest gross agricultural output value in the country, with grain, vegetables and oil crops. , melon and fruit production scale ranks among the top three in the country; Heilongjiang is the province with the widest crop sown area in the country, and the production scale of

cereals, beans, and hemp ranks among the top three in the country; although Inner Mongolia ranks among the top three in terms of total agricultural output value and crop sown area It ranks relatively low, but has outstanding advantages in the production scale of spring wheat, millet, sorghum, oats, buckwheat, mung beans, sunflower seeds, green fodder, sugar beets and other subdivided crops.

(3) *Optimizing the import and export structure*. On the basis of ensuring national food security, we will make a global layout for the import of important agricultural products, promote the diversification of import sources, and establish long-term and stable import channels. Agricultural enterprises are further encouraged to go global, strengthen international agricultural cooperation, improve the global agricultural supply chain, and contribute to world food security and balance while solving conflicts in domestic agricultural products (Du, Lishchynskyy, 2024; Guoyun, 2020).

**Discussion and conclusions**. In the next ten years, China's agriculture will face huge opportunities and challenges. China's comprehensive grain production capacity has been steadily improved, the sown area is stable, the industrial structure of agriculture, forestry, animal husbandry and fishery has been more optimized, and the ability to ensure food supply has been continuously improved. However, China has large population base, small cultivated land area, underdeveloped agricultural technology, serious aging of agricultural workers, and low per capita output will all restrict agricultural development. The "China Agricultural Outlook Report (2024-2033)" predicts that in the next ten years, the planting area of China's three major food crops, rice, wheat and corn, will decrease, but China will ensure food security by increasing unit yields. The increase in industrial consumption will drive food consumption. How to maintain the long-term balance between production and demand, and the balance between supply and demand will play an important role in improving the variety structure, stabilizing grain income, improving quality and efficiency. Utilizing international grain sources to appropriately fill the gap in production and demand for scarce varieties, and increasing international agricultural exchanges and cooperation to improve the variety structure can also greatly alleviate the slight decline in China's agriculture and planting industry.

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**Ду Вей**

# РОЗВИТОК СІЛЬСЬКОГОСПОДАРСЬКОГО СЕКТОРУ КИТАЮ: СТРУКТУРА, ТРЕНДИ ТА ЗАЛУЧЕННЯ ДО СВІТОВИХ ТОРГОВЕЛЬНИХ ПОТОКІВ

*Головною метою цієї статті є аналіз розвитку структури сільськогосподарського виробництва Китаю для визначення переваг і недоліків держави у розвитку сучасного сільського господарства та його залучення до світових торговельних потоків. Виявлено, що у період з 2014 по 2022 рік сільськогосподарський сектор Китаю зазнав значних трансформацій, які були зумовлені серед іншого численними політичними ініціативами, спрямованими на модернізацію та структурні зміни. У роботі відмічається зростання валової вартості продукції сільського господарства, лісового господарства, тваринництва та рибного господарства, підкреслюючи характерні переваги регіонів, що спеціалізуються у цих секторах.*

*Хоча орні землі становлять лише 7% території Китаю, держава забезпечує продовольством 20% населення планети, досягаючи рівня самозабезпеченості зерновими в 95%. У роботі досліджується баланс попиту та пропозиції основних сільськогосподарських культур, а також відмічаються значні покращення національної продовольчої безпеки. У Китаї активно використовуються такі технології, як штучний інтелект та великі дані, що приводить до інтенсифікації сільськогосподарського виробництва. Обговорюються досягнення Китаю в галузі інтелектуальних технологій у сільському господарстві, включаючи точне землеробство, генетичне поліпшення культур та автоматизований контроль за виробничими процесами*

*У статті відмічається зростання динаміки міжнародної торгівлі сільськогосподарськими продуктами Китаю, при значно помітніших темпах приросту імпорту та відносно стабільному експорті. Відмічається вектор на інтернаціоналізацію сільськогосподарської політики держави, у якій наголошується на важливості міжнародного співробітництва та стратегій сталого розвитку, таких як ініціатива «Один пояс, один шлях», для підвищення глобальної продовольчої безпеки.*

*У висновках до статті надаються рекомендації для подальшого формулювання політичних стратегій у сфері сільського господарства Китаю, спрямованих на забезпечення стійкого розвитку та міжнародної співпраці для зміцнення глобальної продовольчої системи.*

***Ключові слова**: сільське господарство, розвиток сільських районів, периферійні регіони, торгівля сільськогосподарською продукцією, експорт та імпорт сільськогосподарської продукції, Китай, глобальна продовольча безпека*