

Research on Agricultural Cooperative Development between China and Thailand Based on Empirical Analysis

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Abstract: The agricultural cooperation between China and Thailand has grown from scratch and developed rapidly. Although the positive situation is still maintained despite the outbreak of the epidemic, the two countries also face certain challenges in the process of cooperation. Therefore, this paper will start with the field and mode of cooperation between China and Thailand, in-depth analysis of the current situation of China-Thailand agricultural cooperation, and explore its difficulties. In addition, the display advantage index, export similarity index and trade complementarity index will be used to analyze the necessity and development prospect of China-Thailand agricultural cooperation, and targeted solutions will be put forward. This study is committed to increasing the depth and breadth of china-Thailand agricultural cooperation, in order to play a certain guiding role in the further deepening of china-Thailand agricultural cooperation.

1. Introduction

In recent years, due to the influence of economic globalization and the rapid development of regional economy, the degree of international trade has become deeper and deeper, and the scope of industrial cooperation among various countries has been broadened, deepened and rich in content. Thailand was once known as the "granary of Southeast Asia", and agriculture plays a great role in Thailand's economic development. Therefore, in the agricultural industry cooperation, China and Thailand are in greater demand. Since the Thai Prime Minister visited China in 1975 and signed the joint communique on the establishment of diplomatic relations between the two countries with Zhou Enlai, the two countries have maintained friendly relations of political mutual trust and economic integration, laying a solid foundation for bilateral cooperation. China and Thailand have not only developed bilateral relations into comprehensive strategic partners, but also deepened friendly exchanges under the framework of China-ASEAN, me, Three River Basin Economic Cooperation Strategy and Regional Comprehensive Economic Partnership Agreement, thus pushing china-Thailand cooperation to a climax.

According to the data of the General Administration of Customs of China in 2021, the bilateral trade volume between China and Thailand reached 131.179 billion US dollars, up 33% compared with the previous year, among which China's export to Thailand was 693.668 billion US dollars, and China imported 611.162 billion US agricultural products from Thailand. Since 2012, China has been Thailand's largest trading partner and importer and exporter of agricultural products. Most of

the high-quality fruits, vegetables and grain in Thailand will be exported to the Chinese market. In addition, after the implementation of RCEP, the improvement of customs clearance efficiency and the further reduction of import and export tariffs will inevitably inject new vitality and provide new development impetus for agricultural cooperation to a greater extent.

Although China and Thailand have made good progress and results in agricultural cooperation, it is undeniable that there are still some problems, such as unbalanced development of agricultural trade, shallow degree of cooperation and similar export of agricultural products. In addition, the proportion of GDP and employment in today's economic development is decreasing, and how to develop in the long term in this changing situation is also a big challenge^[1]. Therefore, we should deeply study the agricultural cooperation between China and Thailand, analyze and solve the existing problems and bottlenecks, and stabilize the friendly economic and trade cooperation, so as to further promote the development of agricultural cooperation between China and Thailand, promote the economic development of the two countries and realize mutual benefit.

2. Literature review and methodological review

From the perspective of research content, Yu Muhe (2015) studied and analyzed the competitiveness and complementarity of the import and export of fruit products, and gave suggestions on how to improve the complementarity of agricultural trade and weaken the competitive relationship between the two sides^[7]. Wang Juanjuan and Liu Xin (2016) discussed the development status of Thailand fruit and vegetable industry and analyzed their bilateral trade situation according to the data, learning from the experience and getting inspiration^[8]. Li Ya and Miao Jingyu (2016) analyzed the current development situation of Zhongtai natural rubber industry from the perspective of supply and demand gap, production capacity and competitive advantage, and put forward the suggestion that the natural rubber industry between China and Thailand should take the differentiated cooperation route^[9]. Under the background of "Belt and Road", Li Wenzhu, Yang Yan et al. (2020) analyzed the development problems of the tea industry cooperation between China, Myanmar and Thailand, so as to provide suggestions for expanding the development space of the tea industry cooperation between the two sides^[10].

From the perspective of research methods, Wang Shuo (2015) used the method of game theory to analyze and deal with China and Thailand, and the conclusion showed that the multi-node cooperation between China and Thailand will play a great role in promoting the development of their agricultural industrial chain cooperation^[11]. Chai Xiaozhuo (2015) used the display comparative advantage index to explore the competitiveness and complementarity of different agricultural products in China and Thailand, so as to explain the role of China-Thailand agricultural cooperation in promoting its economic development^[12]. Ancaili (2018) not only used the comparative analysis method, but also adopted the empirical analysis method to conduct a systematic research on the industrial structure, changes and complementarity of China and Thailand, and introduced the gravity model to explore the development factors affecting the cooperation of China and Thailand natural rubber, so as to promote the cooperation of China-Thailand natural rubber industry chain^[13]. Yun Ruyi (2020) selected the combined qualitative and quantitative analysis methods to study the current situation of agricultural products trade between China and Thailand, and put forward some suggestions to reduce the competitiveness and improve the complementarity between China and Thailand agricultural products^[14].

From the perspective of agricultural situation, XYin (2015) found that there are some problems in China and Thailand, such as similar import and export commodities, similar product results and large price competition of agricultural products^[2]. Wu Xinze (2017) found that there are problems in agricultural cooperation, such as imperfect infrastructure, domestic political turmoil and

agricultural system to be improved^[15]. Yan-li et al. (2019) found that there were great differences in the import volume of agricultural products between China and Thailand, and the development of "Belt and Road" greatly promoted the cooperation between China and Thailand on agricultural products^[3]. Fan Qiong and Zou Dongmei et al. (2021) explained the safety problems of agricultural products existing in the development of agricultural products cooperation in China and Thailand from the perspectives of agricultural product quality, legal system, pesticide residue and so on, which plays a restrictive role in the rapid development of China-Thailand agricultural cooperation to some extent^[16].

From the form of cooperation, Wang Yu and Li Ganqiong et al. (2017), under the background of "Belt and Road" development, proposed that China and Thailand should strengthen their cooperation and exchanges in agricultural trade, investment, science and technology, such as processing investment, cultivation integration, data exchange and other forms^[17]. Achim Walter (2017) advocated that the exponential use of information and ICT in agriculture triggered the fourth revolution in agriculture. In order to develop sustainable agriculture, smart agriculture is the biggest driving force^[4]. Gooch, Elizabeth (2018) found that Chinese enterprises' investment in foreign agriculture will choose to enter the less developed countries with less technical level than China^[5]. Chen Ge and Wang Yuning and others (2019) points out that agricultural cooperation in the future will continue on the road of scientific research cooperation, China and Thailand should strengthen the agricultural science and technology exchanges, technology sharing system, international personnel training as the core cooperation mode^[18].

This paper mainly analyzes the current situation of agricultural cooperation between China and Thailand through the following three methods: First, the literature research method. Tong summarized the existing research results, and consulted the data and data through CNKI, Thai Ministry of Commerce and Un Comtrade and other channels to analyze the current situation of China-Thailand agricultural cooperation. Second, the comparative analysis method. By comparing the development data of agricultural trade between China and Thailand, we can understand the current situation and bottlenecks, and analyze the advantages and disadvantages of agricultural products by comparing the geographical location, climate conditions and natural elements of each country. Third, the empirical analysis method. To explore the empirical analysis, the comparative advantages of China and Thailand and the complementarity of the import and export structure of agricultural products are discussed, so as to understand the cooperation space and future prospects of the two countries^[8].

3. Analysis of the current situation of China-Thailand agricultural cooperation

3.1 Development status of China-Thailand agricultural cooperation

3.1.1 Agricultural cooperation between China and Thailand

Agriculture is an industry integrating planting industry, forestry, animal husbandry, fishery and sideline industry^[19]. Since the cooperation of China-Thailand Agriculture, it has mainly involved in the following areas: 1. Animal disease prevention and control. In 2020, Guangdong Wanda Group and Thailand Luopu Group cooperated on the continuous fermentation of African swine fever, and jointly promoted the prevention and non-rehabilitation project, which covers five aspects: making detailed plans for cooperative farms, jointly exploring the sales market, providing technical services, establishing a knowledge sharing platform and cooperative pig raising. 2. Planting industry field. In 2015, the Rice Department of Thailand invited Hunan Rice Research Institute to Thailand to exchange views on the "China-Thailand Hybrid Rice Technical Cooperation" project, inspected the cultivation of hybrid rice in Thailand and exchanged and discussed on it. 3. Agricultural energy

management field. In 2020, China and Thailand reached an agreement on agricultural cooperation projects, and successfully signed a cooperation agreement in Bangkok. In the cooperation, China promised to fund four agricultural cooperation projects in Thailand in the future, including in the field of agricultural energy management 4. Aquaculture industry. The Freshwater Fisheries Research Center of Chinese Academy of Fishery Sciences has visited Thailand for many times to carry out technical training and on-site consultation for Thai breeding plants, carry out technical cooperation on Belt and Road " fishery cooperation project, and impart the successful experience of Chinese aquaculture and green fishery development model to Thailand.5. Cash crops field. In 2021, China and Thailand agreed to build a rubber tree demonstration base in Thailand. Among them, China Rubber Research Institute provides technical training and provides images to Thai personnel, and is equipped with technological equipment; Thailand Rubber Bureau provides free site for base construction, and arranges personnel for construction and management of the site. As shown in Table 1.

Table 1: Field and project contents of china-Thailand agricultural cooperation

Field of cooperation	contents of a project
Animal disease prevention and control field	Prevent and control non-rehabilitation and cross-border animal diseases
Planting industry	Rice variety improvement, pest control,
Agricultural energy management field	Rural water resources management, soil management, production and waste reuse
The field of aquaculture	Fishery, animal nutrition, livestock and poultry introduction, feeding and breeding
Cash crop field	Tropical fruits, rubber, vegetable cultivation, tropical crops

3.1.2 Sino-Thai agricultural cooperation model

(1) Trade and cooperation

Thailand belongs to the tropical monsoon climate. However, most parts of China are temperate continental climate, and the climate conditions of the two countries are different, so there are differences in agricultural products between the two countries. Thailand mainly produces and exports rice, cassava and rubber, which have comparative advantages, while China mainly produces and exports crops to Thailand for fruits, vegetables and aquatic products. According to data from the General Administration of Customs, the total value of bilateral agricultural trade between China and Thailand in 2021 totaled us \$16.543 billion, with US \$11.902 billion generated from China's import of agricultural products from Thailand, and the remaining US \$4.637 billion from China's export to Thailand^[6].

According to the data, in 2020, Thailand's export volume of natural rubber reached 3.8 million tons. China, as the largest exporter of natural rubber in Thailand, imported about 2.35 million tons, accounting for more than 60%. In the first half of 2021, Thailand exported 552,000 tons of natural rubber to China, up 14% from 2020. China is currently adopting the "go out" strategy, and natural rubber, as a strategic material, is essential for China's future development. China has many people and little land, and has disadvantages for the planting of natural rubber. Therefore, it will import natural rubber from rubber producing countries with Thailand as the core for a long time.

In 2020, the import quantity of Chinese cassava starch was 2.7569 million tons, among which the quantity of cassava starch imported from Thailand was 1.6906 million tons, accounting for

61.32% of the total import proportion; in 2021, the export of cassava products from Thailand reached 10.38 million tons, a year-on-year increase of 45%. China is the largest importer of cassava in Thailand, accounting for 69% of the export volume of Thailand. Cassava is not only a food crop but also a cash crop. It is a major source of clean energy and has huge potential for development, thus increasing China's demand for it.

This shows that china-Thailand economic and trade cooperation is developing steadily, and there is a large space for bilateral trade development.

(2) Technical cooperation

In order to solve the problems of "enough" agricultural supply, "good quality" and "strong" competition, we cannot do without the support of agricultural science and technology. We must rely on scientific and technological progress to learn from each other^[20].

Compared with China, Thai agriculture has a low level of science and technology and lacks certain competitiveness, which has caused certain obstacles to the vigorous development of its own agriculture. Therefore, agricultural scientific and technological cooperation has become the main mode of cooperation between China and Thailand. The contact and communication between agricultural research institutes, universities and project development and research teams in China and Thailand have become more and more frequent, and they have gradually become an important force in agricultural technology cooperation between China and Thailand^[21]. For example, in 2014 Wuhan technical team in Bangkok for Thailand illustrates the beidou foundation system after enhanced positioning service more accurate, its high precision positioning in the agricultural development innovation application, and further discusses the on the basis of RTK technology the core autonomous driving system and the application of drones in agriculture, China's advanced technology and effective combination of natural resources will play a great role in the development of Thai agriculture. In 2020, The College of Agriculture and Technology of Chinese universities conducted a discussion and exchange on the first cooperative research project of China and Thailand, introduced the research progress of "the demonstration and promotion of high-yield cultivation technology of oyster mushroom in summer" and planned the plan and arrangement of the next step.

(3) Investment and cooperation

In 2013, when implementing the large-scale infrastructure renewal, Thailand said that it welcomed Chinese investment in all fields in Thailand, and hoped to strengthen the cooperation with China, whether in high-tech industries or labor-intensive industries^[22].

According to the data in Figure 1, during 2004-2016, China's direct investment in Thailand was mainly in metal and machinery and equipment, agriculture, chemical industry, textile and other industries, among which agriculture accounted for the second place, accounting for 18.90% of the total investment. According to the 2019 data of the Investment Promotion Council of Thailand, China's agricultural investment in Thailand accounted for 10% of its total investment, which has declined due to the COVID-19 pandemic. Since the establishment of the LMC Special Fund in 2017, China has funded and assisted a number of agricultural cooperation projects, nine of which were led by the Thai side, with a total investment of about 2.2 million US dollars, equivalent to 68 million Thai baht. The implementation of the project will help the bottom Thai farmers learn advanced agricultural technology and successful experience, while teaching what they have learned to other countries. In addition, the official implementation of the RCEP project in 2022, the further reduction of agricultural tariffs and the further facilitation of customs clearance conditions will expand China's investment space in Thailand to a greater extent, and the proportion of agricultural investment between China and Thailand is expected to increase.

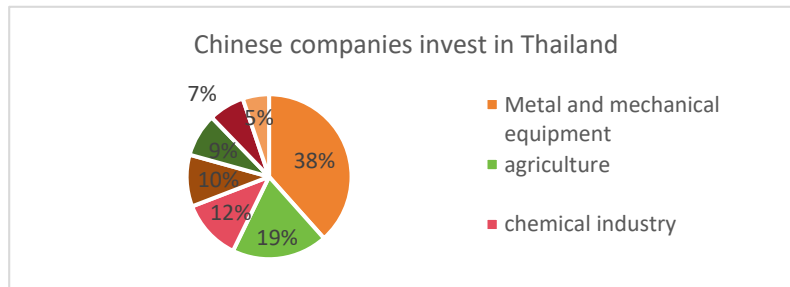


Figure 1: Distribution of direct investment industry between China and Thailand

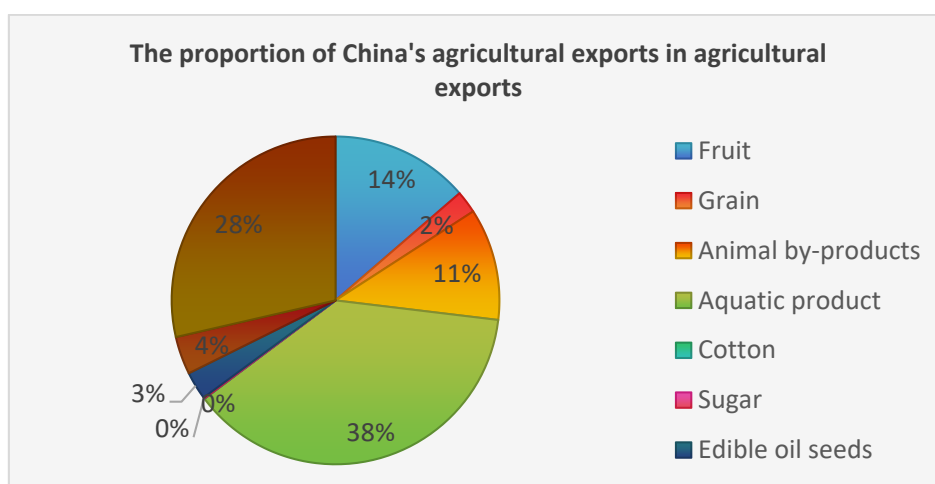
3.2 The Bottleneck of China-Thailand agricultural cooperation

Through the appeal analysis, we learned that the contacts and exchanges between China and Thailand are getting closer, the areas of agricultural cooperation are expanding, the technical exchanges are becoming more frequent and the investment is gradually strengthened. Both China and Thailand have benefited a lot from this. However, it cannot be ignored that there are also some difficulties and challenges in china-Thailand agricultural cooperation.

3.2.1 Similar to exported agricultural products

China ranks first in the world in terms of agricultural production, some of which is for domestic demand consumption and some for trade export. The export strength of agricultural products ranks fifth in the world, showing a strong advantage in agriculture. However, Thailand is not willing to be left behind. At present, about 80% of the Thai population is engaged in agricultural work, and the output of rice, rubber, cassava and other crops ranks among the top in the world, and it has great advantages in exporting labor-intensive products, especially in agricultural exports.

According to the data of Figure 2 of the Ministry of Agriculture and Rural Affairs of China, from the perspective of the export structure of agricultural products, China's export of agricultural products in 2021 mainly include aquatic products, vegetables and fruits. Thailand's natural resource endowment is very conducive to the cultivation of tropical fruits, rice and rubber and the cultivation of aquatic products. In terms of export targets, China's agricultural products are generally distributed in Japan, South Korea, Vietnam, USA, and Thailand, mainly in China, Japan, the US, Cambodia and Vietnam. In the top five export markets, China and Thailand have three overlapping export targets. It can be seen from this that there are great similarities between China and Thailand both in terms of the export types and in the export market of agricultural products. Therefore, the fierce competition in the agricultural market makes the cooperation between China and Thailand face certain challenges.

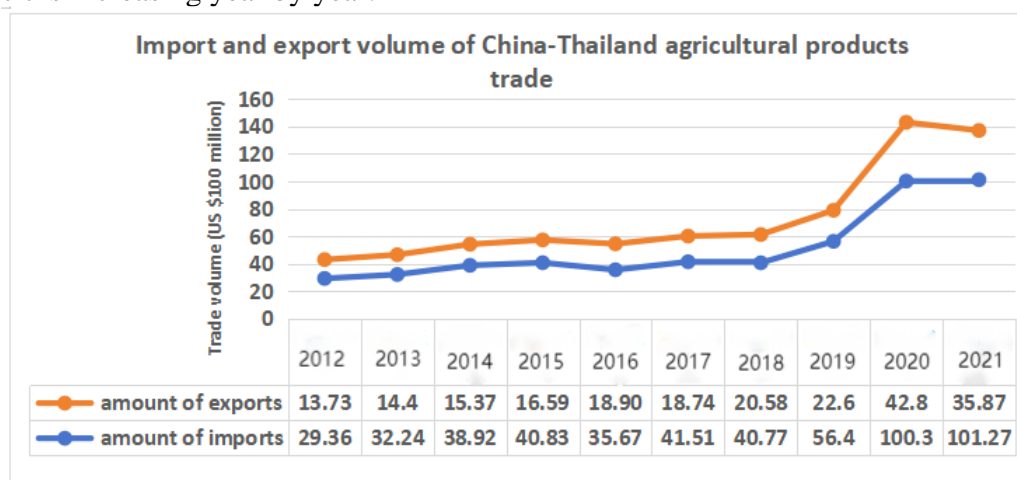


2Figure 2: The proportion of China's agricultural exports in agricultural exports (%)

3.2.2 Unbalanced trade development

According to the analysis of export structure, the similarity of agricultural products exported by China and Thailand is higher, and the more similar the agricultural products in the market, the greater the crowding effect on the markets of various countries, and the economic loss will be greater^[23]. 2021 data show that China has not only become the largest agricultural export target, but also the largest agricultural import partner; Thailand is not only the third largest agricultural importer, but also the fifth largest agricultural export market.

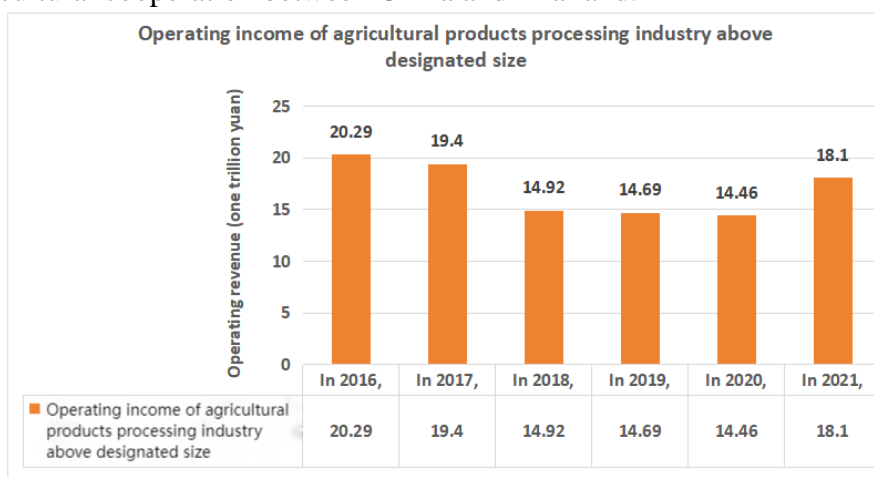
According to the data in Figure 3, in the past 10 years, China's agricultural exports to Thailand expanded from \$1.373 billion in 2012 to \$3.587 billion in 2021, a growth rate of 161.25%; while the amount of agricultural products imported from \$2.936 billion in 2012 to \$10.127 billion in 2021, a growth rate of 244.93%. The growth rate of Thailand's agricultural export trade to China is significantly higher than that of Thailand's import trade from China. In addition, it is not difficult to conclude that in 2021, China's trade volume of agricultural products imported from Thailand is about 2.8 times that of China's agricultural products exported to Thailand, which shows that China's bilateral trade in agricultural products is in a trade deficit. In addition, according to the line chart, the agricultural trade deficit between China and Thailand is showing a trend of expansion, and the trade deficit is increasing year by year.



3Figure 3: Import and export volume of agricultural products between China and Thailand

3.2.3 Low degree of cooperation

China and Thailand have a relatively independent agricultural industrial chain and a certain industrial carrying capacity, but compared with the developed countries such as the United States and Canada, they rely on a narrow and shallow problem^[24]. In addition, the development of the agricultural products processing industry in Thailand is thriving, the initial processing of products is greatly effective, while China's agricultural products processing is still in a relatively backward state. According to the data of Figure 4, from 2016, China's agricultural products processing business revenue trend has decreased from 20.29 trillion yuan in 2016 to 14.46 trillion yuan in 2020, with a negative growth of 28.73%, and only increased until 2021, with a year-on-year growth of 12%. Both the raw material market and the processing of agricultural products are of great significance for enhancing the value of the agricultural industrial chain between China and Thailand. However, currently the upgrading of the industrial chain is at a bottleneck, which weakens the impetus of agricultural cooperation between China and Thailand.



4Figure 4: Import and export volume of agricultural products trade

4. Empirical analysis of China-Thailand agricultural cooperation

4.1 Display sex comparative advantage index

American economist Basassa proposed a display comparative advantage index for how to judge which country's industries are more competitive in the international market. The specific formula is as follows:

$$RCA_{ij} = (X_{ij} / X_j) \div (X_{iW} / X_{tW})$$

Among them, X_{ij} refers to the export amount of product i in country j ; X_{tj} refers to the total export value of all commodities in country j ; X_{iW} refers to the total export amount of i products in the world, and X_{tW} means the total export value of all commodities in the world. In general, when the ratio of RCA_{ij} is greater than 1, the product advantage in the world market and the market competitiveness; otherwise, the country lacks certain competitive advantage.

According to Table 2, in the past two years, the export display advantage of Chinese agricultural products has fluctuated about 0.3. However, the export display advantage index of Thailand is much higher than 1, indicating that Thailand demonstrates great comparative advantage and market competitiveness; instead, China RCA index is low, at a disadvantage and weak international competitiveness. From another point of view, it also shows that Thailand can produce in large

quantities and export its products with comparative advantages to China, which shows that China and Thailand have great cooperation potential and development space in the development of agricultural products.

2Table 2: Display Comparative advantage Index of agricultural products in China and Thailand

	China's agricultural exports	China's total exports (US \$100 million)	RCA Index (China)	Thailand's agricultural exports	Total Thai exports (US \$100 million)	RCA Index (Thailand)
In 2021	843.5	32290.78	0.31	380.9	2711.735	1.63
In 2020	760.6	26647.84	0.28	316.2	2339.50	1.33
In 2019	785.7	21264.66	0.39	363.2	2462.44	1.56
In 2018	797.1	24531.48	0.35	288.0	2524.86	1.76
In 2017	755.3	22635.22	0.37	268.3	2359.30	1.79

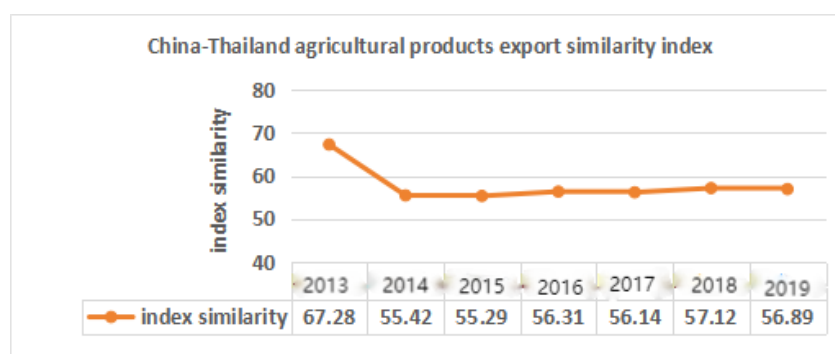
4.2 Exit structure similarity

At the end of the 20th century, Glick and Rose proposed the concept of export similarity index in the market domain to calculate the degree of competition among countries in the market. The calculation formula is as follows:

$$Sp(ijw) = \left[\sum \text{Min} (X_{tiw}/X_{iw}), (X_{tjw}/X_{jw}) \right] * 100\%$$

Among them, ij represents two competitive countries, t refers to the wealth accumulated by the two countries in the process of foreign trade, W is the global trading market, and X represents the total trade and export value of each country. The similarity index range of export market products is (0,100). When the higher the index, the closer to 100, the more similar the export market products of the two countries are; otherwise, the similarity is lower.

According to Figure 5, the export similarity index began to decline in 2013, from 67.28 to 55.42 in 2014, indicating that the competition between agricultural products between China and Thailand has eased, and the trade situation has improved. From 2014 to 2019, the similarity index of agricultural products exported by China and Thailand began to fluctuate around 55, indicating that there is great similarity between China and Thailand in agricultural exports, and there is competition between the two countries. However, it can also be seen from the figure that the fluctuation range of the similarity index of export agricultural products in the past five years is small, indicating that the competitive situation between China and Thailand in the market remains stable. Since 2018, the similarity index of exported agricultural products has begun to decline slightly, indicating that the degree of specialization between China and Thailand has begun to increase, and the potential for cooperation and development has increased.



5Figure 5: Similarity Index of China-Thailand agricultural exports

4.3 Trade Complimentation Index

Peter Drysdale In the 1960s, the trade complementarity index was proposed to analyze the complementarity between the import structure of A products and the export structure of B products. The calculation formula is as follows:

$$TCI_{ij} = \sum[(RCAX_{ik} \times RCAM_{jk})]$$

In this formula, $RCAX_{ik}$ is the comparative advantage of country i in export k products, while $RCAM_{jk}$ indicates the comparative disadvantage of country j in import k products. When the value of TCI_{ij} is greater than 1, it indicates complementarity between the products of ij , and the greater the index, the opposite indicates that complementarity does not exist.

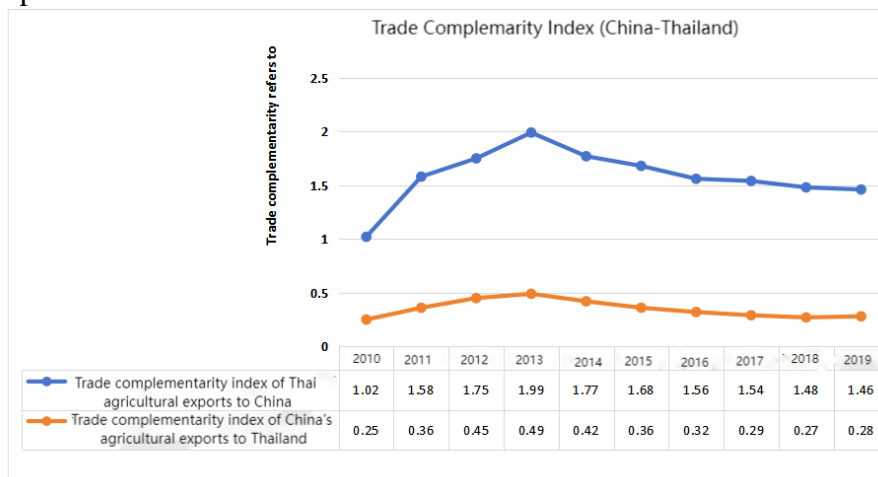
According to the data of Figure 6, the trade complementarity index of Thailand's agricultural products export and China's import has been higher than 1 for ten consecutive years, it shows that the agricultural products of the two countries have long had a complementary relationship, and also indicates that China is also highly dependent on Thailand. In addition, it can be seen that the trade complementarity index of China's imports from Thailand showed a slight downward trend, indicating that with China's growing economic strength and the implementation of the "internal cycle" strategy, its dependence on foreign imports has also relatively declined. On the other hand, the trade complementarity index of China's agricultural exports to Thailand is less than 1 and none exceeded 0.5, indicating that the trade complementarity of China's agricultural exports to Thailand is at a low level. In general, in the agricultural trade between China and Thailand, China is relatively dependent on foreign countries, but there is still a lot of room for improvement in complementarity. It can also be shown that the agricultural cooperation between China and Thailand has a good future and there is a certain space for cooperation.

4.4 Empirical analysis

It can be seen from the empirical analysis that China and Thailand not only have competitive relations, but also have complementary relations in agricultural trade. However, further analysis shows that China and Thailand are more suitable for cooperation and development. Thailand has good terrain conditions and suitable climate conditions such as unique advantages, make Thailand in tropical crops and aquatic products has a good development foundation, and the natural resources endowment and scientific and technological level differences, makes the structure of agricultural products is different, so Thailand in agricultural production and export of relative China has a comparative advantage, and China's highly complementary.

Therefore, China and Thailand should pay attention to the current co-operation between the two countries in agriculture, adopt ways to expand the fields and modes of co-operation, enhance

complementarity, make up for the deficiencies and solve the problems on the basis of complementarity, clarify and give full play to their respective strengths, and continue to push forward and deepen the agricultural co-operation between China and Thailand, so as to promote the economic development of the two countries.



6Figure 6: Similarity index of China-Thailand Agricultural products trade

5. Countermeasures and suggestions

First, relevant institutions should optimize the structure of China-Thailand agricultural products. China and Thailand have certain differences in geographical location, natural environment, factor endowment, and scientific and technological development. In speaking, China has a significant advantage in labor resources, while Thailand has a large advantage in land resources. Therefore, for Thailand, it should vigorously and continue to promote the development of cassava, rubber, corn, rice, durian and other industries, and increase the production and export of tropical agricultural products and agricultural products with land resources. For China, it should focus on the production and export of temperate agricultural products and agricultural products with superior human resources, such as fruits, vegetables, tea and animal husbandry, to complement the import and export needs of agricultural products of the two countries. At the same time, Thailand should increase the application of agricultural technology and advanced management experience in agricultural products planting, cultivation and other links, to promote agricultural mechanization and modernization^[25]. China should combine the current situation of agricultural development, promote the scale of agriculture, extend and develop the industrial chain, enhance the added value of agricultural products, and achieve long-term sustainable development. On the basis of their respective comparative advantages, the two countries should develop superior agricultural products and optimize the allocation of resources to a certain extent, so as to adjust the export structure of agricultural products of various countries, reduce the competitiveness of their agricultural products in the global market and increase their complementarity, reduce the similarity of export products, and maximize the interests of both sides.

Second, to ease the agricultural trade deficit. China should implement the centralized teaching of agricultural technology and increase the investment and application of agricultural science and technology, the centralized purchase and use of machinery and equipment, to a certain extent, can reduce the cost of labor and materials, then reduce the production cost of agricultural products, improve product quality and then expand its export. In addition, China can increase the investment in Thai agriculture, agricultural products and agricultural products processing industry. With the help of Thailand's rich land resources and the reference of Thailand's successful development

experience in agriculture, make up for the defects of China in agriculture, reduce China's agricultural production costs and improve the market competitiveness. At the same time, it can also solve a large amount of import demand in China, which can alleviate China's trade deficit to a greater extent.

Finally, we need to promote the upgrading of the agricultural industry chain. China and Thailand should base on their own comparative advantages, explore deeper, longer and wider industrial chains, and vigorously promote the development of primary processing, deep processing and comprehensive processing of agricultural products. Thailand can establish and improve the rice, starch and byproducts of deep processing industry chain, industrial cooperation with our country, China's technology advantage for the cloud computing, remote sensing, AI technology research and development and guidance application, equipment upgrade and deep processing, Thailand is responsible for planting cultivation, production and production of finished products, through their respective advantages coordinated division of labor, greatly enhance the added value of agricultural products, promote vertical development of bilateral agricultural cooperation.

6. Conclusion

This paper discusses the current situation of China-Thailand agricultural cooperation, and uses multiple indexes to analyze whether the agricultural cooperation is necessary and has the development space. By showing advantage index, advantage in agricultural production and exports, Thailand through export similarity index calculation discusses the exports between China and Thailand is similar, but in recent years in the steady state level and specialization increased, through trade complementarity index, China's agricultural imports and Thai export structure is complementary, so the cooperation is expected to be further developed. The conclusion of this paper can not only provide targeted suggestions for the agricultural development of China and Thailand, but also play a guiding role for the further deepening of china-Thailand agricultural cooperation.

However, there are also some shortcomings in this paper, which need to be deeply discussed and studied in the follow-up research. First of all, the agricultural cooperation between China and Thailand is a complex problem. Due to its wide range of involvement and a large amount of information, the analysis of the current situation still needs to be enriched and improved. Secondly, the process of industrial cooperation and development is dynamically changing, so the research on the cooperation field, product structure, division of labor and other issues between China and Thailand need to be further tracked and supplemented.

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