

# Agricultural development status and key cooperation directions between China and countries along “The Belt and Road”

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**Abstract.** The Belt and Road initiative will improve the interconnection among Asian, European and Africa, promote international trade and the optimal allocation of factors of production among the counties along the Belt and Road. There are abundant agricultural resources and many agricultural countries along the Belt and Road. Promoting agricultural international cooperation has great important significance in putting forward the Belt and Road initiative construction, ensuring food security and promoting sustainable development of the Belt and Road even all over the world. This study researched on the spatial pattern of agriculture resources, agricultural development advantages and disadvantages of the countries along the Belt and Road and the agricultural trade between these countries and China, and based on this, advanced some strategies for our country in promoting agricultural cooperation to the other countries of the Belt and Road which contains: “Land imports”, overseas “high-tech green agriculture park” construction and establish “green agriculture international cooperation and development alliance of the Belt and Road initiative”. And then, we put forward some safeguard suggestions. This research took the international perspective and scientific analysis to support the national strategy of “The Belt and Road”, and the conclusions will provide a strong theoretical basis and strategic support for the construction of “The Belt and Road”.

## 1. Introduction

Along the “Belt and Road” region, there are abundant agricultural resources and numerous agricultural powers [1]. Strengthening agricultural cooperation is of great significance to the implementation of “the Belt and Road” and the maintenance of the “Belt and Road Initiative” area and even the world's food security and development [2]. Therefore, it is necessary to reveal and analysis the agricultural spatial pattern and the international trade situation of these countries of this region and based on this research to put forward the key direction of China's agricultural cooperation with them to promoting the development of all the countries along ‘the belt and road’ region [3].



## 2. Models and Methods

This study USES the statistics provided by the World Bank and apply the ARCGIS spatial analysis technology and software to analysis the spatial pattern of agricultural development and international trade along the belt and road region.

## 3. Results and Discussion

### 3.1. Agricultural development situation in countries along “The Belt and Road”

There are many agricultural countries along “the Belt and Road”, accounting for four of the top ten countries in terms of agricultural value added. Among them, China's agricultural added value reached 924.027 billion dollars in 2013, ranking first in the world, India was 337.525 billion dollars, ranking third in the world, Indonesia was 125.402 billion dollars, ranking fifth in the world, Russia is 81.714 billion dollars, ranking the ninth in the world. In addition, the added value of agriculture in Southeast Asian countries such as Pakistan is also more than 50 billion dollars, which is also in the forefront of the world. Agriculture has a relatively high proportion of the national economy of the countries in “the Belt and Road”. In particular, Afghanistan, Pakistan, Nepal, Laos, Cambodia and other countries account for more than 20% of GDP. Among the five Central Asian countries, Tajikistan, Kyrgyzstan and Uzbekistan Stan's agriculture also accounts for more than 15% of GDP. It can be seen that agriculture plays an important role in the national economic system of countries in the “Belt and Road Initiative” area in 2013. The “Belt and Road Initiative” area was rich in cereal production. Five of the world's top ten grain producing countries are in the region, and three out of the top five are in the region. The “Belt and Road Initiative” area are the regions where the distribution of agricultural land in the world is relatively concentrated, and the agricultural land accounts for a relatively large proportion of the national area. According to the per capita arable land area, there are a large number of countries with densely populated areas along “the Belt and Road”. Almost all countries along the Belt and Road are higher than the per capita arable land area of China. In particular, Russia, Central and Eastern Europe, Central Asia, Laos, Thailand, Cambodia and other countries have high per capita arable land and huge agricultural development potential.

### 3.2. Agricultural development advantages and disadvantages in countries in the “Belt and Road Initiative” area

#### 3.2.1. Agricultural development advantages and disadvantages of Russia.

*Advantages.* Russia has abundant agricultural resources, with a total land area of 170.982 million square kilometers, agricultural land accounting for 13% of the country's land area, and the world's largest black belt. Since 2000, agriculture has become the priority of national development policies. The Russian government has increased its support for agriculture. Agriculture, especially grain production, is growing rapidly.

Russia has become the world's third-largest wheat exporter and has an important position in the world food market. In addition, pumpkin feed, potatoes, sugar beets and other production are also among the highest in the world. In 2013, Russian agricultural output increased by 6.2% year-on-year, of which grain and bean crops reached 91.3 million tons, up 28.8% year-on-year, and pig and poultry production reached 12.2 million tons, up 4.8% year-on-year, and grain exports were 19 million tons. (table 1).

*Disadvantages.* Despite the huge production of agricultural products in Russia, the product structure is not complete. A large number of agricultural products such as fruits and vegetables are highly dependent on foreign countries. The countries of Europe, the United States, China and the Commonwealth of Independent States are the main sources of Russian agricultural imports. In 2013, Russian food imports totaled 27,026,900 tons, including 9,503,100 tons of fruits and vegetables, accounting for 35.2%; meat and meat products, 2,241,100 tons, accounting for 9.0%; milk and dairy

products, 1,462,800 tons, accounting for 5.4%; fish 893,200 tons, accounting for 3.3%; alcohol and non-alcoholic beverages 1.749 million tons, accounting for 6.5%.

**Table 1.** Production of major crops in Russia.

	Pumpkin feed	Wheat	Potatoes	Beets	Pasture, silage and corn	Basic vegetables
2009	11820	6173.975	3113.396	2489.2	2487.569	1482.706
2010	8940	4150.758	2114.054	2225.594	1281.361	1328.3491
2011	12210	5623.999	3268.147	4764.327	3079.612	1590.6955
2012	10000	3771.964	2953.253	4505.7	2192.3426	1568.0274
2013	11060	5209.0797	3019.9126	3932.1161	2591.0926	1548.5353

Every year, Russia imports about 2 billion euros worth of fruits and vegetables from the EU, and imports about 1 billion euros worth of food and agricultural products from the United States. However, it has often changed due to factors such as economic sanctions and anti-sanctions in Western countries, which has affected the stability of agricultural imports.

According to statistics from the Russian Academy of Agricultural Sciences, due to the lag in the development of logistics, warehousing and transportation systems and the lack of technology and equipment, the annual loss of grain is 15 million to 20 million tons, 1 million tons of meat and 7 million tons of milk. Only about 280,000 tractors and 90,000 harvesters are needed in Russia to harvest all the grain.

### 3.2.2. Agricultural development advantages and disadvantages of Mongolia

*Advantages.* Animal husbandry is a traditional advantageous industry in Mongolia. It is the foundation of Mongolia's national economy and accounts for 80% of Mongolia's agricultural added value. It is the main raw material source for Mongolia's processing industry and daily necessities. There are 171,000 former herder families and 327,100 herdsman. The output value of animal husbandry accounts for 10% of export earnings. In 2014, there were 519.7 million head of livestock in the country, a year-on-year increase of 14.2%. The main varieties are sheep, horses, cattle, camels, etc. (table 2).

**Table 2.** Main varieties of Mongolian animal husbandry.

Species	Livestock volume		2014/2013		Account for the total proportion	
	2013	2014	Increment	Percentage	2013	2014
<b>Total</b>	45144.3	51970.4	6826.1	115.1	100	100
<b>Horse</b>	2619.4	2995.2	375.9	114.4	5.8	5.8
<b>Cow</b>	2909.5	3412.8	503.3	117.3	6.4	6.6
<b>Camel</b>	321.5	349.3	27.8	108.6	0.7	0.7
<b>Sheep</b>	20066.4	23209.5	3143.0	115.7	44.4	44.7
<b>Goat</b>	19227.6	22003.6	2776.1	114.4	42.6	42.3

*Disadvantages.* Mongolia is sparsely populated, with poor natural conditions and a bad climate. Although the animal husbandry industry is developed, it still needs to import a large amount of meat and milk every year to meet domestic demand. Agricultural output value only accounts for less than 20% of the total output value of agriculture and animal husbandry. The main crops in Mongolia are wheat, barley, potatoes, cabbage, radishes, onions, garlic, and rapeseed. Wheat and potato production can basically meet domestic demand, and vegetable production can meet about 60% of domestic demand.

Mongolia imports a large amount of grain, meat, vegetables and fruits from abroad every year. Imported agricultural products mainly come from China, Russia, the United States and other countries. China is the largest importer of agricultural products in Mongolia (table 3).

**Table 3.** Imports of major agricultural products in Mongolia in 2013.

Cereals		Meat and internal organs		Edible vegetables and tubers		Melons and nuts	
Country	Volume	Country	Volume	Country	Volume	Country	Volume
Global	\$11,856,182	Global	\$24,712,179	Global	\$12,988,415	Global	\$12,600,847
China	\$6,451,404	United States	\$12,425,427	China	\$12,370,745	China	\$5,101,687
Russia	\$4,687,566	Poland	\$7,615,986	Russia	\$159,038	Philippines	\$1,626,081
United States	\$281,589	China	\$3,353,318	Korea	\$144,439	Poland	\$1,529,577
Korea	\$174,849	Canada	\$646,785	Poland	\$84,082	Belgium	\$1,435,528
Japan	\$148,754	Australia	\$266,390	Netherlands	\$79,662	Korea	\$513,323
Thailand	\$58,920	Hungary	\$230,350	India	\$66,285	Russia	\$380,572
Vietnam	\$17,901	Germany	\$53,684	Kazakhstan	\$43,532	United States	\$377,967
Poland	\$12,258	Russia	\$53,121	Germany	\$16,269	Germany	\$340,947
Kazakhstan	\$11,255	Japan	\$51,774	United States	\$11,489	Italy	\$139,584

### 3.2.3. Agricultural development advantages and disadvantages of Central Asian countries

*Advantages.* The five countries of Central Asia are sparsely populated, rich in light, heat, water and soil resources, and have unique resource advantages for developing large-scale agriculture. Among them, Tajikistan and Kyrgyzstan have the most abundant water resources, and Kazakhstan has the most abundant land resources. Therefore, the five countries in Central Asia are well-developed. The main agricultural products are wheat, corn and other food crops and cotton. It is one of the world's major food, cotton producing areas and exporting places. Among them, the planting area of wheat in Kazakhstan and other countries is as high as 90% of the total area.

Cotton planting is also widely distributed in Uzbekistan, Turkmenistan, Tajikistan and other countries, especially Uzbekistan. Cotton planting is the pillar industry of Uzbekistan. Uzbekistan is the fifth largest cotton producer and the second largest cotton exporter in the world. The average annual output of seed cotton is 3.6 million tons, lint is 100-1.2 million tons, and exports are 7-10 million tons. Cotton in Uzbekistan and Turkmenistan and wheat production in Kazakhstan have a greater impact on world exports.

*Disadvantages.* Despite the development of crop production in the Central Asian countries, the output and export volume are relatively high. But due to factors such as agricultural financing difficulties, backward agricultural science and technology, and low degree of agricultural mechanization, the output of agricultural products per unit area of farming is much worse than that of developed countries, and the level of land intensive use is not high (table 4).

**Table 4.** Agricultural production per unit area (kg/ha).

Country\Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Russia</b>	1860	1887	1990	2387	2281	1843	2259	1858	2240
<b>Mongolia</b>	481	1098	943	1383	1552	1370	1485	1564	1337
<b>Kazakhstan</b>	997	1170	1327	1009	1249	804	1689	762	1164
<b>Kyrgyzstan</b>	2678	2551	2513	2380	3034	2610	2603	2367	2904
<b>Tajikistan</b>	2164	2159	2440	2141	3119	3117	2519	2891	2798
<b>Uzbekistan</b>	4042	4112	4399	4352	4634	4529	4734	4645	4766
<b>Turkmenistan</b>	2927	3288	2974	2673	2429	2575	2025	1778	1988
<b>China</b>	5,225	5,424	5,320	5,548	5,447	5,527	5,701	5,851	5,891

### 3.3. Bilateral trade between China and countries in the “Belt and Road Initiative” area

Countries in the “Belt and Road Initiative” area have close bilateral trade with China in the agricultural sector. Russia, the five countries of Central Asia, India and other countries have brought the country of major agricultural products to China for the “Belt and Road” economy. At the same time, it is also the main export destination of China's agricultural products (figure 1) Among them, the trade volume between agricultural products between Russia and China is the largest, and China's exports to Russia are mainly labor-intensive products such as vegetables, fruits and horticultural products. Russia is the fifth largest fruit consumer market in the world. Due to its full range of fruit exports, nutrient-rich, convenient transportation and low prices, China has become one of Russia's largest fruit importers.

Russia's exports to China are mainly resource-intensive products such as aquatic products. After 2010, feed products and oil crops have been added. In the future, China will have stable demand for Russian dairy products. At present, Russia is the largest importer of Chinese aquatic products, and imports from Russian aquatic products account for about 30% of China's total imports of aquatic products.

## 4. Conclusion

Based on the above analysis, we provide the agricultural cooperation strategy between China and countries in the “Belt and Road Initiative” area.

### 4.1. Jointly building a “high-tech green agricultural park” to comprehensively promote the “Belt and Road Initiative” area national agricultural resources development cooperation

Focus on capital, talent, industry, equipment, information and other advantages, in Russia, Mongolia, Central Asia countries, Pakistan, Thailand, Myanmar, Malaysia and other countries, focus on the layout, build a group of high-tech-supported, green and organic features Agricultural park. Actively promote the formation of a bilateral cooperation mechanism, the Chinese side provides investment and scientific and technological support, and the partner countries provide policy support and guarantees such as fiscal and taxation, land, development and management rights. Relying on high-tech green agricultural parks, we will carry out agricultural R&D cooperation, transformation of agricultural scientific and technological achievements, promotion of green agriculture, and large-scale operation of agricultural industry.

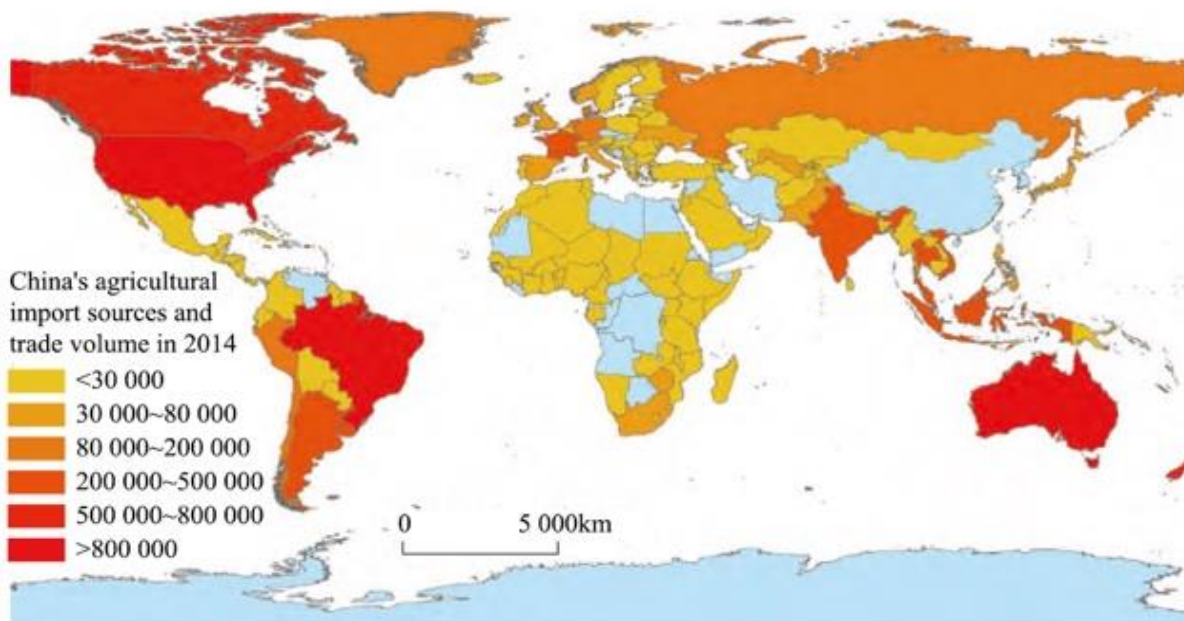
### 4.2. Strengthening the deep processing cooperation of agricultural products

Central Asia countries, Mongolia and other countries export a large number of agricultural primary products, but they are limited by the weakness of capital, technology and industrial base. They have

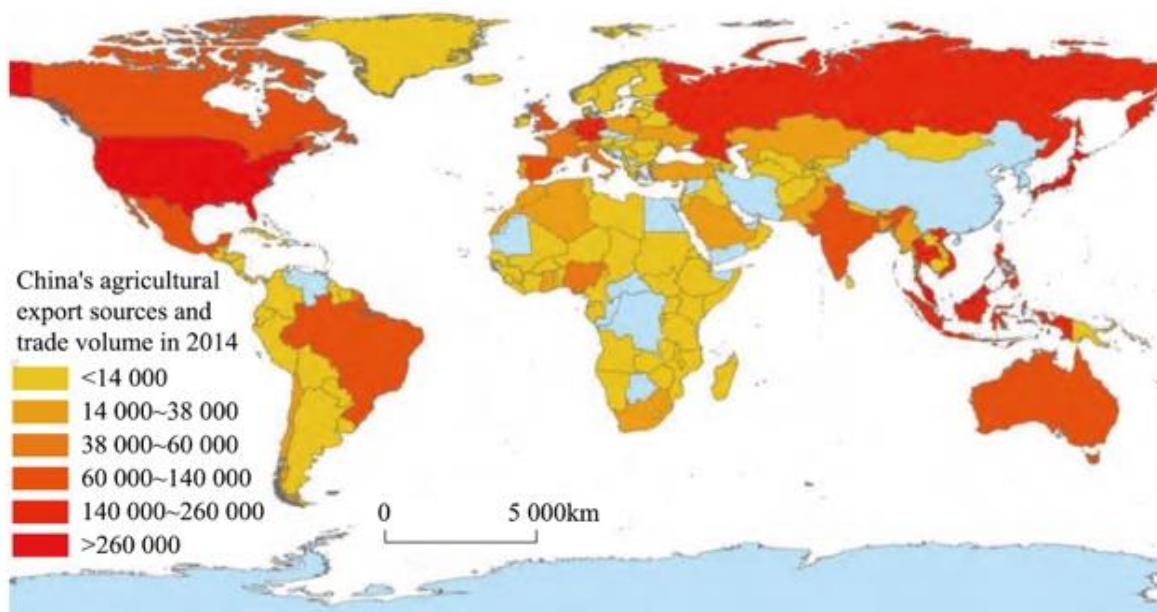


not yet formed a sound industrial system in the fields of deep processing of agricultural products, high-end health products and pharmaceutical products. China's agricultural product processing, biomedicine and other aspects have relatively mature technology and industrial systems. The prospect of strengthening cooperation in the field of agricultural product processing in the future is broad.

a.Import



b.Export



**Figure 1.** China's agricultural import and export in 2014.

#### 4.3. Actively promote agricultural financial cooperation

There are a large number of developing countries along the “Belt and Road”, and there are great difficulties in agricultural financing and investment. This leads to inefficient development and utilization despite the abundance of agricultural resources. All countries have given higher policy support and fiscal and tax incentives for agricultural investment, and hope to actively attract foreign investment in agricultural development. Through financial institutions such as the AIIB and domestic policy banks, China can guide funds into the agricultural development areas of countries along the route, and participate in the agricultural development of countries along the route through loans, joint investment, and equity participation.

#### 4.4. Strengthen cooperation in agricultural service industry and promote the development of agricultural modernization

Comprehensively strengthen the extensive and in-depth cooperation between China and countries in the “Belt and Road Initiative” area in the fields of agricultural science and technology research and development, agro-ecological protection and governance, organic agricultural product cultivation, agricultural machinery equipment purchase and leasing, agricultural product intensive processing, biomedicine and other agricultural service industries. Thereby promoting green, modern and sustainable development of the nation.

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#### References

- [1] Zou J, Liu C, Yin G and Tang Z 2015 Spatial patterns and economic effects of China's trade with countries along the Belt and Road *Progress in Geography* **34**(05) 598-605 (in Chinese)
- Zhang Y, Yang G and Yang Y 2015 The Belt and Road: an opportunity to strengthen agricultural cooperation between China and central Asia *Journal of International Economic Cooperation* **1** 31-4 (in Chinese)
- Song S 2014 Expand agricultural cooperation with other countries under the "the Belt and Road" *Journal of International Economic Cooperation* **9** 63-6 (in Chinese)
- [2] Uang Y 2015 Understanding China's "Belt and Road Initiative" as part of its new economic diplomacy *International Economic Review* **1** 48-53 (in Chinese)
- Liu H, Yeerken W and Wang C 2015 Impacts of the Belt and Road Initiative on the spatial pattern of territory development in China *Progress in Geography* **34**(5) 545-53 (in Chinese)
- Zheng L and Liu Z 2015 Spatial pattern of Chinese outward direct investment in the Belt and Road Initiative area *Progress in Geography* **34**(5) 563-70 (in Chinese)
- Gong P, Song Z and Liu W 2015 Commodity structure of trade between China and countries in the Belt and Road Initiative area *Progress in Geography* **34**(5) 571-80 (in Chinese)
- Du D and Ma Y One Belt and One Road: The grand geo-strategy of China's rise *Geographical Research* **34**(6) 1005-14 (in Chinese)
- [3] Liu W 2015 Scientific understanding of the Belt and Road Initiative of China and related research themes *Progress in Geography* **34**(5) 538-44 (in Chinese)
- Dong S, Huang Y, Li Z, Shi G, Mao Q, Li J and Yu H 2014 Economic Development Patterns and Regional Economic Integration Modes for the Silk Road Economic Zone *Resources Science* **36**(12) 2451-58 (in Chinese)