CLIMATE POLICY INSTITUTE

# China's Agricultural Strategy:

## Past, Present, & Future

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## Introduction

The food security of China is heavily dependent on imports of agricultural products. As and industrially developed nation, the role of agriculture is less an economic than a sovereignty issue for the country. In 2022, the sector's share in China's GDP was 7.3 percent, which is not marginal, however, not dominant either. On the other hand, a country of 1.4 billion people can become highly vulnerable and lose a great deal of its sovereignty if it is heavily dependent on food imports and if global supply chains suffer a rupture or collapse; not to mention the intentional withdraw of supplies from partners, which, especially in times of war or conflict is a frequently applied technique.

**It is therefore strongly in China's interest to become as self-sufficient as possible, not predominantly for economic, but for sovereignty reasons.**

Agriculture in China dates back millennia and has given rise to some of the most important crops globally. The civilization was among the first to introduce advanced irrigation techniques to feed its large population. This population growth put China on top of the world as the most populous country for centuries until April 2023, when it was overtaken by India.
For centuries, the struggle to feed itself has been a major challenge for China, with bad weather, bad planning and bad leadership having resulted in some of the worst famines in history.

Over the past thirty years however, famine has become a marginal issue in the country, as it has entered the club of developed nations and managed to supply its population with sufficient food, be it imported or via domestic production.

Today, China is among the top exporters, as well as being the main importer of several agricultural products globally. This makes the country an important player in international food product trade. Moreover, it has had an effect on China's sovereignty. If self-sufficiency is achieved in the most important agricultural products that provide the basis for the everyday meals of 1.4 billion people, the country's sovereignty is much stronger. However, if imports are needed for even the most basic food products, sovereignty is compromised. An analysis of the most important crops in China's exports and imports can assist any understanding of China's situation on this matter.

Finally, China's development in agriculture affects every country, and European ones are no exception. In this study, Chinese agriculture's impact on European agriculture is also examined.

## Agriculture in China – a brief history

Agriculture dates back to before 8000 BC in China, making it one of the earliest farming societies in the world. Having domesticated foxtail and broomcorn millet, as well as hemp and Chinese cabbage, China strongly contributed to modern agriculture thousands of years ago. By domesticating water buffalo, swine and poultry, they also made significant first steps in animal breeding as well.

[1] https://natlib.govt.nz/records/31848365?search%5Bi%5D%5Bsubject%5D=Agriculture+--+History&search%5Bpath%5D=items&search%5Btext%5D=Europe+--+History+--+20th+century+--+Juvenile+literature

Irrigation systems came not long after. The annual rise and fall of water levels enabled people the develop one of the first irrigation systems between 8000 and 7000 BC in the Yangtze River basin. This contributed to the intensification of rice production, enabling the growing population to be fed.

And grow it did. According to modern estimates (that are less reliable the further back they go in time) China's population reached 100 million in the middle ages, was over 200 million in the 1700s, surpassed 500 million between the two world wars, and hit 1 billion in the early 1980s. To understand modern agriculture in China it is helpful to analyse the progress that made this population growth (as well as bad agricultural practice that sometimes made the decrease of population) possible throughout history.

European, and in general, western historical writing tends to thoroughly study ancient and modern Chinese history and overlook the period between. However, the agricultural progress between the prehistoric times of domestication and modern agriculture can only be understood if the centuries between them are also examined.

The dynasties of imperial China were relatively stable partly due to the lack of an independent power base consisting of major landlords whose power rivalled that of the emperor; a powerhouse that was very much present and therefore resulted in frequent coups and changes of dynasty in the Roman Empire[2]. The lack of this powerhouse was mainly the result of property size. The power of landlords was constantly decreased to provide imperial stability, and by the end of the imperial period, landowners with a few hundred acres were considered powerful, but most only had a few acres. This undoubtedly resulted in a decreased economy of scale, as well as major differences in the food security of the people based on the landowner's management skills, climate, soil quality and property size.

During the same period, natural landscapes have been converted into rice fields at a rapid rate. Massive mountainous areas were burnt, resulting in the downstream washing of slit into valleys, thus fertilizing them and enabling the production of rice[3].

In early medieval times, frequent conquests from different Turkic and Middle-Asian people groups, as well as climate deterioration resulted in a population drop and agricultural shift in Northern China. Highly developed farming systems reverted to nomadic pastoral communities on a large scale[4]. Even where plant breeding remained, most farms were smaller than three hectares in area. In this period, mainly thanks to interactions with multiple people groups from outside China, traditionally Chinese crops have been completed by several fruit and vegetable species. By the last centuries of the first millennium, interactions with Persian and Arab traders become usual, and bread also entered China as a staple food.

During the decades of the Mongol conquests (13th-14th centuries) population levels were highly unstable, varying between 108 million and 67 million, dropping and rising again through the decades[5].

[2] https://www.researchgate.net/publication/289730533_Food_and_environment_in_early_and_medieval_China
[3] https://www.researchgate.net/publication/289730533_Food_and_environment_in_early_and_medieval_China
[4] https://www.researchgate.net/publication/289730533_Food_and_environment_in_early_and_medieval_China
[5] https://www.researchgate.net/publication/289730533_Food_and_environment_in_early_and_medieval_China

Besides the violence of these conquests, this phenomenon can be explained by the lack of stability in agricultural production, an inevitable consequence of war. As McNeill and Mauldin (2012) state: "Reliance on wet rice cultivation also made Chinese agriculture vulnerable to disruption and war, as became clear when the Mongols overran China in the thirteenth century"[6].

Perkins (2013) refers to the period between the 14th and 20th century as "Six Centuries of Rising Grain Production" in China[7]. Goldstone (2003) found grain output to be relatively stable and constant from 1400 to 1820, suggesting a technical stagnation and resulting in a lack of labour release from agriculture to manufacturing, a process that took place in Britain during this period[8].

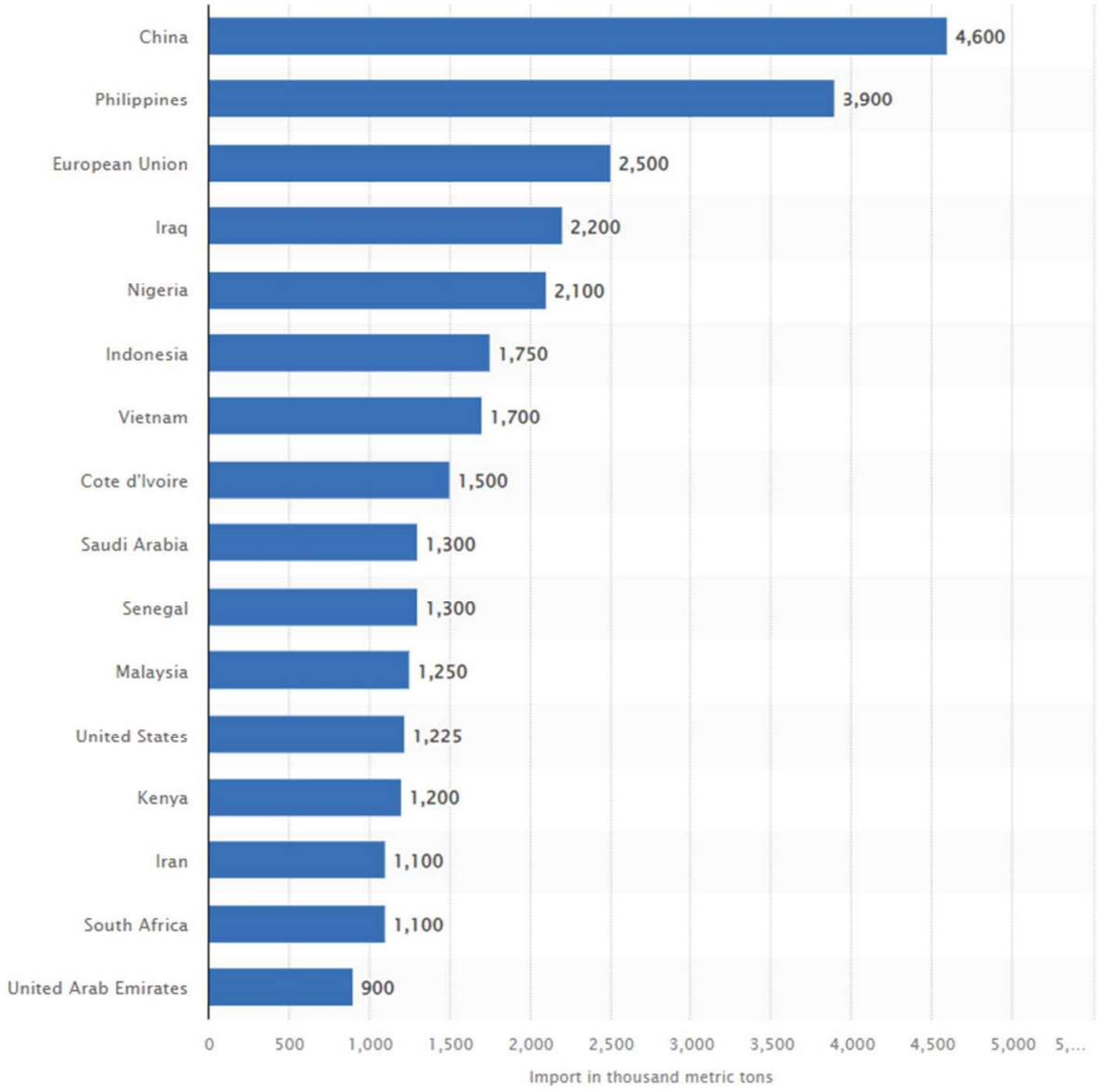
Chuanmin and Falla (2006) analysed how far industrialization got China until the very beginning of the 21st century[9]. They found that the country has insufficient natural resources (for agricultural production), abundant labour resources, low labour productivity but relatively high land productivity. They also concluded that the small size of Chinese farms hinders increases in labour productivity and in farmers' incomes – a truth that can be told about Chinese agriculture from the beginning. Another important finding was that China's agriculture has low intensification, limited mechanization but a high level of chemical usage – seriously harming the environment. Finally, they suggest that the organization of Chinese farmers is limited, resulting in a low ability to overcome natural and market risks.

This was the situation at the beginning of the 21st century that China had to face to increase its level of self-sufficiency.

**China's main agricultural exports and imports**

Self-sufficiency is however not yet achieved, not even from the most basic crops. The figure below shows the main rice importers globally for the 2022/2023 season.

[6] https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118279519.ch3
[7] https://www.taylorfrancis.com/books/mono/10.4324/9781315082776/agricultural-development-china-1368-1968-dwight-perkins
[8] https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9b735ba903e76c8992f49b5c8094dffab4b192d0
[9] https://www.researchgate.net/publication/233561037_Agro-Industrialization_A_Comparative_Study_of_China_and_Developed_Countries




*Top rice importer countries in the world (Source: Statista 2023)*

The crop that provides more calories to China's population than any other is not grown in China in a sufficient quantity. Last year, they had to import 4.6 million metric tons of rice. This is however not so significant, considering that it means less than 4 kilograms of rice per person, and slightly more than 2% of China's rice production.

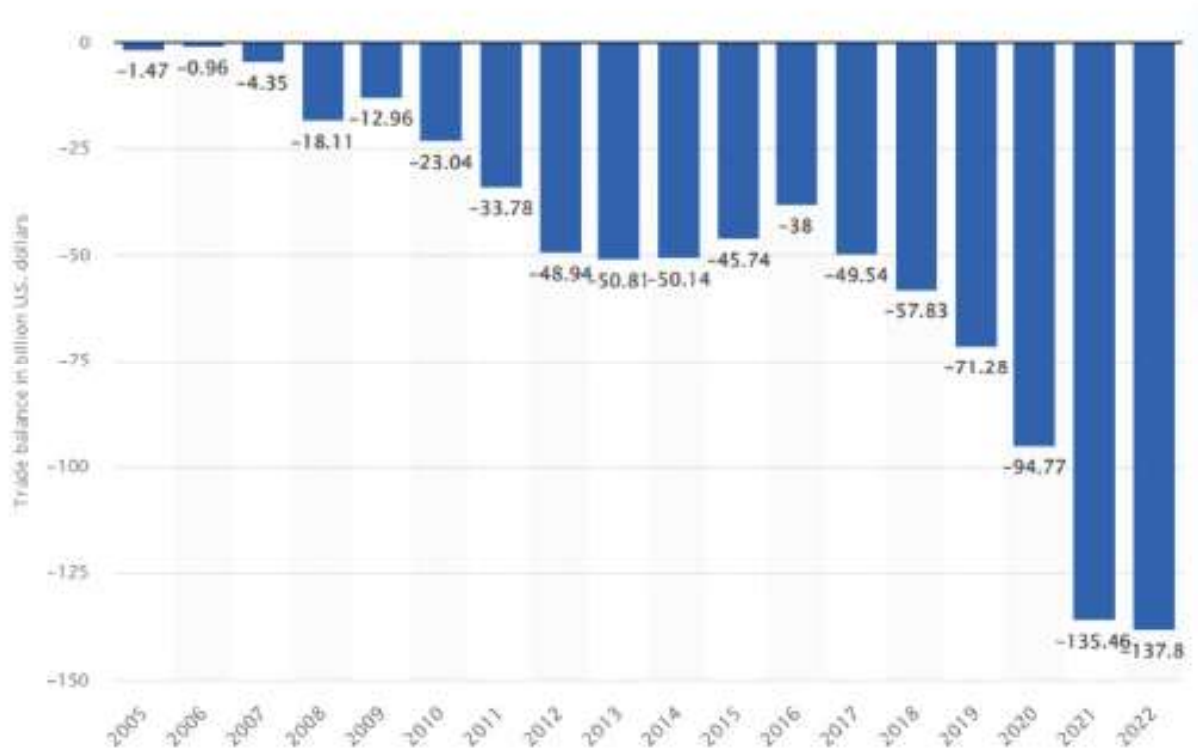
Rice is a land-intensive product, and China tends to need import from land-intensive crops, being a country with vast population and vast areas of land that are not arable. On the other hand, China tends to be a major exporter of labour-intensive crops, a category mainly consisting of fruits and vegetables.

For instance, China has been the largest apple exporter in the world every year since 2015, and usually reaches exports worth more than $1 billion. The country is also first in the export of pears, tea, and often soy sauce as well.

This last one is especially significant, considering that China is simultaneously the largest importer of soybeans. Importing raw materials and exporting processed products with a high added value is often a quality of developed countries.

China is not only a top exporter but a top producer of chicken eggs: 30 million tonnes are produced each year, meaning more than 20 kilograms for each person. This is of course not consumed by its own population; China exports $194 million worth of eggs each year. This large-scale production has a role in the nourishment of the Chinese population with not only sufficient calories, but also proper macro elements - in this case, proteins. The country's diet has changed in the past few decades, resulting in a more complete nutrition. As a result of this, the average height of Chinese men saw the biggest rise in the world at nearly 9 cm over the past 35 years.

Overall, however China has a significant trade deficit in agricultural products at almost $138 billion in 2022.




*Trade balance of agricultural products in China from 2005 to 2022 (Statista,2023)*

This figure shows not only that the trade balance of agricultural products is consistently negative, but also that there is has been a steep rise in the trade deficit. This however is the result of multiple factors, not simply the fact that China is becoming less and less self-sufficient.

[10] https://www.globaltimes.cn/page/202110/1235772.shtml

## Self-sufficiency and Sovereignty

The described trade deficit in agricultural products suggests a lack of self-sufficiency, thus a decreased level of sovereignty. However, the $138 billion trade deficit of 2022 does not mainly consist of staple foods, the category that has the most crucial effect on a country's sovereignty. $2.6 billion worth of rice is imported each year, and as formerly mentioned, this quantity is barely more than 2% of the country's own production. The remaining $135 billion translates to the import of crops that are less crucial in China's food security and calory intake: meat, fruits, vegetables, tropical products, luxury products (coffee, chocolate etc.) are all imported in great quantities, as the standard of living in China saw an unprecedented rise in the 2010s.

This suggests that China could increase its self-sufficiency should conflicts arise or supply chains be disturbed. A serious lack of non-staple foods and luxury goods might take place, but the country would not necessarily be short of calories. In 2020, when global supply chains were compromised or collapsed, China could decrease its rice imports to 1.52 million tonnes and still feed its population[11].

For China, the role of agriculture is less an economic than a sovereignty issue. In this sense, China has a reasonable level of self-sufficiency, and therefore a certain level of sovereignty based on its food production. The country is almost self-sufficient in rice, the most important staple food for its people. It could potentially become completely self-sufficient in the case of unpredictable need to do so.

Another important aspect of agriculture and China's sovereignty is the country's decreasing population. For the first time in decades, 2022 saw the Chinese population drop. This is likely to remain the trend for the coming decades, decreasing the country's population to 1 billion by 2080 and 800 million by 2100. This population decrease along with the progress of Agriculture 4.0 is likely to increase Chinese self-sufficiency in the field of agriculture and food production and enable China to remain stable even in times of conflict or war.

## Effects of Chinese Agriculture on Europe

As one of the most important actors in global agriculture, China has a significant effect on the sector throughout the world and Europe is no exception.

The most promising opportunity for Europe is provided by the increasing standard of living in China, that enables the consumption of goods with high added value. A society of 1.4 billion people, an upper and a middle class that is growing to count hundreds of millions is creating and will create significant demand for European products, and a great potential to profit.

Many agricultural products that are traditionally produced in Europe in large quantities are widely consumed in and imported to China. China is the world's largest pork importer with 2.2 million tonnes already imported in 2023. At the same time, some of the world's top pork exporters are in Europe: worldwide, Spain is first, Germany is third, Denmark is fifth[12].

[11] https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/agriculture/102121-chinese-rice-imports-soar-as-exports-hold-steady-on-year

[12] https://oec.world/en/profile/hs/pig-meat#:~:text=Exporters%20and%20Importers&text=Pig%20Meat%20are%20the%20world's,and%20Denmark%20(%243.19B)

A similar pattern is visible in the case of chicken. China is once again the leading importer, while Poland, the Netherlands, and Germany are third, fourth, and fifth, respectively, on the exporters' list.

These two examples are only a few to show the potential in Chinese-European trade. It is therefore in Europe's interest to strengthen economic connections and trade with the East Asian country, since the growth of Chinese upper and middle class will only increase this potential.

## Conclusions

Agriculture in China, as in most industrialized countries, is more a question of sovereignty than of economy. In this sense, China is in a favourable position, since it is or could be able to provide its people with staple foods and basic commodities.

Chinese agriculture has a history dating back millennia and has given the world many of its most economically important crops. However, a problem with economies of scale has constantly been present throughout these years, as most Chinese farms were small and inefficient. Agriculture in China still needs to undergo major modernization programs to improve the latter, and provide self-sufficiency in more essential crops.

China is the largest exporter and importer of many agricultural products. Imports mainly consist of land-intensive commodities, whereas the country mainly exports labour-intensive crops. The latter tend to have a higher level of added value. The steep growth of the standard of living resulted in a trade deficit of billions of dollars every year in agricultural products.

In terms of sovereignty, the most important crops are the ones that provide staple food for the people. In the case of China, this is chiefly rice. The country is not completely self-sufficient regarding these crops; however, the country is able to produce the vast majority of the calory intake of its population and could likely provide for its people in case of a conflict, especially given its shrinking demographics.

Europe can greatly profit from China's growing consumption of non-staple foods and luxury commodities, as placing products of a high added value, thus achieving major profits is more and more on the table as the standard of living in China is growing, along with the upper and middle classes. Moreover, the consumption of China is visibly growing in many products that are traditionally produced in Europe in great quantities.

China is likely to remain a key player in global agriculture and the trade of food products, and is not too far from achieving self-sufficiency and a stronger sense of sovereignty if the circumstances so demand.

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