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Food security in a food self-sufficient economy: A review of China's ongoing transition to a zero hunger state

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Abstract: In a contemporary globalised world, assuring food security in the conditions of developing a food self-sufficient economic structure represents not only a challenge in terms of the changing agricultural paradigm, but also an important instrument in assuring, in a long-term manner, societal resilience. However, while achieving self-sufficiency in food, China still faces challenges in terms of establishing sustainable food security and transitioning to a zero hunger state. Rapid economic growth and urbanisation have resulted in shifting food consumption patterns from crops towards more nutritious meat and dairy products and higher-qualitative imported foods. In this study, the current state of food security and production and trade in food and agricultural products in China during 2000–2020 have been analysed and an overview of the strategic directions of the domestic sustainable development, food security, and zero hunger policies are highlighted. The main aim of the study is dedicated to identifying the critical shortcomings and gaps in combating hunger and food insecurity in China and proposing policy recommendations regarding improving the stability of the food supply in the country and deigning new possible strategies to achieve it. The results highlight the major trends and shifts of the food security paradigm in the process of developing a food self-sufficient economy.

Keywords: access to food; agriculture; availability of food; hunger; poverty; sustainable development; trade

For decades, Asian countries have faced the problems of hunger, food insecurity, and the adequate and stable supply of food and agricultural products (Jana and Karmakar 2016). According to the United Nations (UN) (2020), ending hunger and providing access to safe, nutritious, and sufficient amounts of food by 2030 are recognised among the core Sustainable Development Goals (SDGs). Food insecurity challenges are very complex. As stated by the Food and Agriculture Organization of the UN (FAO 2008), they include providing physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Four main dimensions, or pillars, of food security are recognised: availability (supply side of food security, the physical availability of food in the stores), access (economic side of food security, the ability of the people to buy food products in a sufficient quantity), utilisation (nutrient side of food security, having sufficient energy and nutrient intake), and stability (sus-

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tainability side of food security, stable availability, accessibility, and utilisation of food over time).

As has already been argued in literature (Zhang and Cheng 2016; Gao 2017), being the biggest country in the world and one of the major actors in global governance, China is playing a particularly prominent role in pursuing the SDGs. However, the approach of the country to the interpretation of security is somewhat different compared to those commonly used in academic circles in the West (Zhang and Cheng 2016; Gao 2017). In the 20th century, there were periods when China experienced extreme poverty and severe food insecurity and hunger. In the 1980–1990s, there were estimations that the population growth rates would overcome those of the agricultural production, the Chinese agricultural sector would fail to meet the skyrocketing demand, and the dramatic increase in food imports by China would aggravate the food insecurity problem globally (Erokhin 2020).

Currently, the Chinese agricultural sector feeds over 1.4 billion people, with over 737 million people living in rural areas as shown in Mukhopadhyay et al. (2018). Considering these figures, as well as the well-remembered hunger calamities, it is natural that China emphasises the food supply as the imperative factor of food security. In Chinese academic literature, the availability dimension stands out against access, utilisation, and stability, while food security is predominantly approached as self-sufficiency and every possible increase in domestic food production (Zhang 2011; Luan et al. 2013). Two decades ago, the goal of a 95% food self-sufficiency rate was set by the government for wheat, rice, and corn (State Council of the People's Republic of China 1996). As of today, this ambitious threshold has been achieved, the domestic output is sufficient to feed the world's biggest population, and the quality of the people's nutrition is remarkably improved. The *per capita* consumption of diversified high-quality and high-nutrient foods has grown along with the intake of nutrients, proteins, fat, and carbohydrates. Since the late 1970s, over 750 million people have been lifted out of poverty (State Council Information Office of the People's Republic of China 2019) – the greatest-ever contribution to the reduction of global poverty and the achievement of the zero hunger SDG (United Nations 2020). The recently approved National Strategy of Food Security of China declared the continuing focus on food consumption, the issues of access to food by vulnerable people, and combating poverty and hunger. China aims is to achieve complete security in staple foods and establish self-sufficiency in grain on the basis of a combination of domestic production of grain and moderate imports (State Council Information Office of the People's Republic of China 2019).

Thus, China is self-sufficient in staple foods by means of developing the domestic agricultural sector (Dev and Zhong 2015). Does it mean food security, however? In both the establishment of absolute food security and the achievement of the zero hunger goal, China faces certain challenges. For instance, China is still facing challenges related to the stability of the food supply. China's policies are targeted at the prevention of the over-dependence on imports, but China still heavily depends on foreign supplies in some sectors (oilseeds, for example). The agricultural trade balance has increasingly been negative for China since the early 2000s. The government attempts to avoid disruptions in the supply of major foods by managing food prices and food stocks, but the high dependence on imports poses threats to the stability of the food supply due to volatile food prices and any disruption in the foreign food supply chains. This problem particularly manifested itself in the early days of the COVID-19 outbreak, when many transborder supply chains were broken. Thus, food security policies are targeted in such a way as to support the rural and urban poor, but social stability depends on external factors a great deal.

Considering these challenges, the studies in the sphere of food security should capture all four FAO dimensions other than solely focusing on food availability. In this article, the authors attempt to build a broader vision of food security and zero hunger policies in China by considering not only the production, but also the trade in agricultural products, overseas agricultural investment and supply chains, and diversification in the food supply. This study attempts to identify the critical shortcomings and gaps in combating hunger and food insecurity in China and elaborate upon policy recommendations aiming at improving the stability of the food supply in the country.

MATERIAL AND METHODS

As it follows from the analysis of various approaches to understanding food security, even if a country achieves self-sufficiency in major crops and other foods, the sustainability of the food supply is still challenged in the long-term perspective by market volatilities, economic access to sufficient, diverse, and nutritious food, and the stability of agricultural value chains. In an attempt to reflect the complexity of the is-

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sue, we have employed the three-stage approach to the assessment of food security in China.

At stage 1, in line with China's current focus on self-sufficiency, the food production capabilities are assessed for the major crops (rice, wheat, corn, and soybeans). Both the opportunities (increasing yields) and shortcomings (scarce land resources, environmental problems) are revealed in the light of a further increase in the domestic crop production.

At stage 2, we analysed China's agricultural trade to identify the external threats to food security. Trade data are obtained from the UN Conference on Trade and Development (UNCTAD) (UNCTAD 2020). The SITC Commodity classification [the all food items aggregation, SITC (Standard international trade classification) 0 + 1 + 22 + 4] is employed to capture the total volume of agricultural exports and imports. The 37 arrays are established to represent major agricultural products traded between China and the rest of the world in 2010–2020.

At stage 3, China's dependence on imports of particular food products from particular countries is addressed through a prism of Chinese overseas agricultural investments to identify potential threats to the stability of the food supply chains. The gaps are illustrated by comparing the degree of the dependency and the concentration of the suppliers. Twelve staple products which China imports the most are considered, including soybeans and other oilseeds and oils, meat, and grains.

The implications of the obtained findings for food security are further discussed in relation to the current anti-poverty and anti-hunger programmes of China's government and the strategic directions of zero hunger policies in the country.

RESULTS

Agricultural production. Since 2000, China's agricultural sector has grown substantially (Huang and Yang 2017) (Table 1). The rapid development of the agricultural sector has allowed China to ensure food self-sufficiency and globally contribute to the solution of food insecurity and hunger problems. Currently, China feeds over one-fifth of the world's population with only 7% of farming land (Cui and Shoemaker 2018).

The increase in domestic agricultural output has been driven by many factors, the most important of which are market reforms in agriculture (Fan 1997), institutional innovations in rural areas, modernisation of farming technologies and practices, and agricultural investments. The intensification of agricultural production and the development of agriculture-related infrastructure in rural areas (Huang and Yang 2017) has allowed China to substantially increase the yields for major crops (Figure 1).

As it can be remarked from Figure 1, the *per capita* output in agriculture is now above the world average (474 kg in 2020, a growth of 14% compared to 2000). The average productivity of the major crops increased up to 5.63 tonnes per ha (a growth of 32.5% in 2020 compared to 2000) (Figure 2), including rice – 6.92 tonnes per ha (+11.3%), wheat – 5.48 tonnes per ha (+46.8%), corn – 6.11 tonnes per ha (+17.4%). For all three crops, the productivity is above the world average (rice – by 50.1%, wheat – by 55.2%, corn – by 6.2%) (Erokhin and Gao 2019). The total output of food and agricultural products approached 670 million tonnes (a growth of 45.7% compared to 2000).

Table 1. Annual average growth rates of agricultural production, population, and GDP *per capita* in China in 2000–2020 (%)

Indicators	2000–2005	2006–2010	2011–2015	2016–2020
GDP in agriculture	+4.3	+4.5	+4.1	+3.5
Wheat	+1.1	+2.5	+2.0	+0.3
Cotton	+5.3	–0.9	–2.1	+0.2
Oil-bearing crops	+2.0	+0.8	+1.4	+1.1
Friuts	+29.2	+6.0	+12.8	+3.2
Meat	+5.1	–3.1	+7.7	–2.3
Fish and aquatic products	+3.9	+4.0	+3.0	+1.1
Population	+0.6	+0.5	+0.5	+0.4
GDP *per capita*	+9.0	+10.6	+7.5	+5.3

GDP – gross domestic product

Source: Authors' own elaboration, based on National Bureau of Statistics of China (2021)

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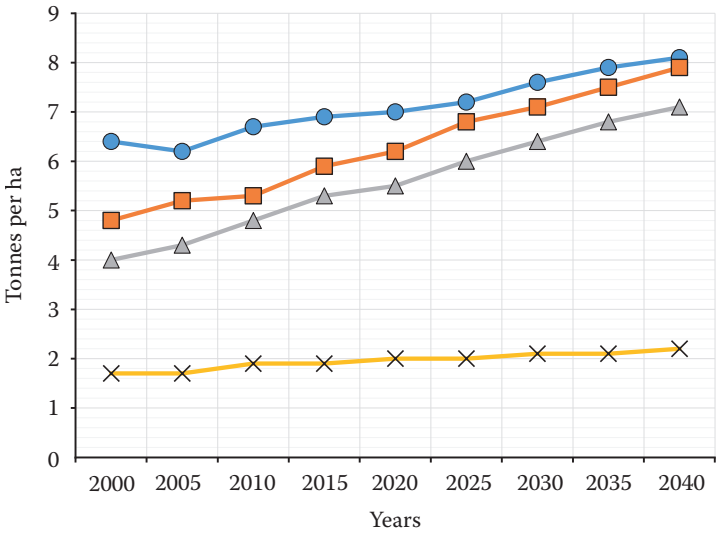

Figure 1. Crop yields in China

Source: Authors' own elaboration, based on Gro Intelligence (2018)

The increase in the productivity, however, has damaged the environment and caused land degradation (Zhang et al. 2013; Zhang and Cheng 2016). The soybean productivity is well below that of the other staple foods. This is one of the reasons why China tends to import soybeans instead of expanding its domestic production (Cui and Shoemaker 2018). One of the methods used to increase the output is to expand the acreage. Since the 1960s, the total acreage has increased (Figure 3), but still only 12.8% of the lands in China are suitable for farming (Chen 2007). Small farms and households dominate the agricultural sector (Ma 2011), while the land area *per capita* (0.08 ha) is well below the world average (0.22 ha) (Nath et al. 2015; Gao et al. 2018).

The adverse effect of the degradation of lands on the agricultural output is complicated by the progressing climate change and its implications for the cultivation of moisture-sensitive and temperature-sensitive crops. The high susceptibility of yields to adverse

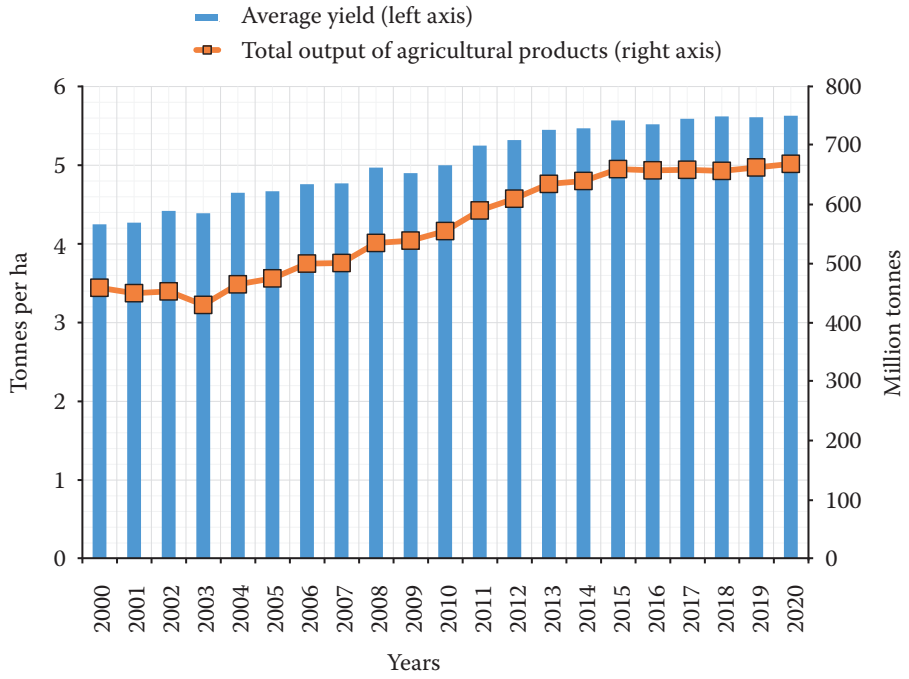

Figure 2. Average yield and total output of agricultural products in China

Source: Authors' own elaboration, based on State Council of the People's Republic of China (2019) and National Bureau of Statistics of China (2021)

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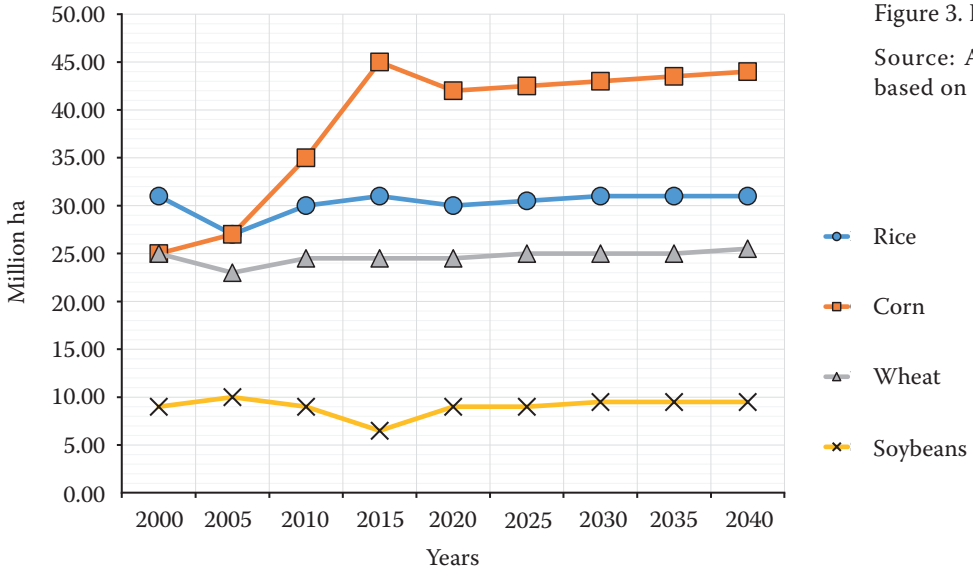

Figure 3. Farm areas by crops

Source: Authors' own elaboration, based on Gro Intelligence (2018)

environmental impacts (such as drought conditions experienced in 2020) is especially relevant for the southern provinces where, on the one hand, a significant amount of the population is concentrated, and, on the other hand, the land and climatic conditions do not allow ensuring the grain output required by the market (Zhang et al. 2018; Erokhin and Gao 2019). Such territories critically depend on food supplies from the outside in the event of unfavourable climatic and hydrothermal conditions in a given year. It poses a serious threat to the food security of the population and the self-sufficiency of the economy. Even in relatively favourable periods (in terms of climatic conditions), poor soils and low humidity do not allow one to increase yields significantly to independently meet the domestic demand for staple foods (Lu et al. 2015).

Agricultural trade. Since 1978, the economic reforms in China have been directed towards opening the domestic market for agricultural and food imports (Park et al. 2002; Huang and Rozelle 2006; Sun and Heshmati 2010; Huang et al. 2017). After joining the World Trade Organization (WTO) in 2001, China introduced changes in its tariff policy and cut many tariffs (for instance, for rice and wheat). This has resulted in the growth of a negative balance in China's food trade with the world (Erokhin 2019b) (Figure 4).

China declares its strict commitment to international obligations, particularly, in the format of the WTO,

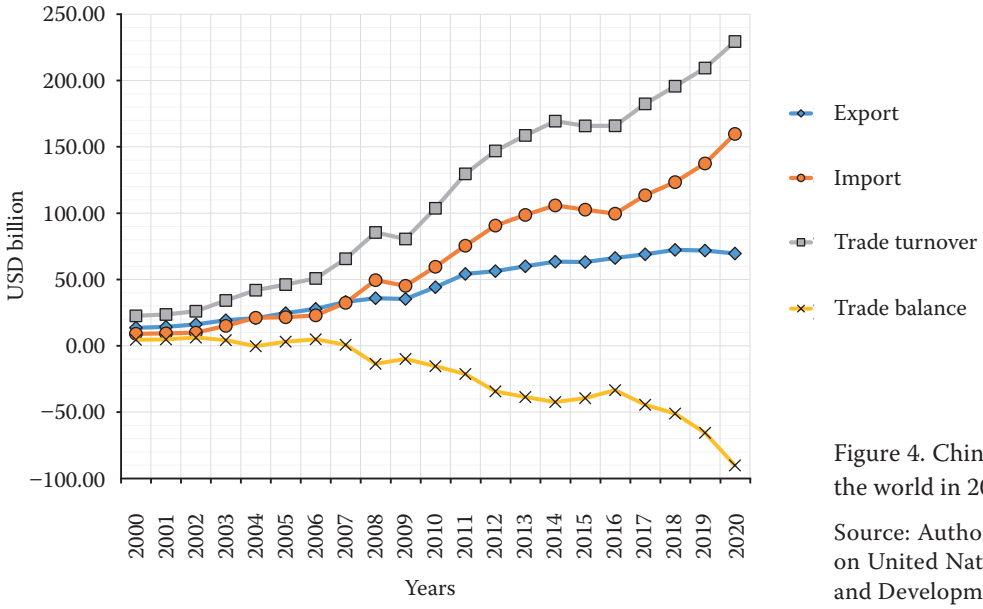

Figure 4. China's agricultural trade with the world in 2000–2020

Source: Authors' own elaboration, based on United Nations Conference on Trade and Development (2022)

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sharing its food market with the supplies from other countries (State Council 2019). In 2020, the country exported over 3.5 million tonnes of agricultural products, while the volume of import exceeded 120 million tonnes, primarily, soybeans, grains, and grain powders (National Bureau of Statistics of China 2021). Major export products are fish (fresh, chilled, frozen, dried, etc.), crustaceans, and molluscs (taken together, 26.3% of the total agricultural exports in 2020), vegetables (fresh, prepared, and preserved) (20.7%), fruits (fresh, preserved, and prepared) (15.2%), edible products and preparations (8.1%), and feed stuff for animals (4.2%); see Table S1 in the electronic supplementary material (for ESM, see the electronic version). The contribution of fruits, vegetables, and edible products and preparations to exports increased in 2000–2020, while that of the crops, meat, and dairy products decreased.

The volume of imports has substantially grown since the 2000s, primarily, for soybeans and other oilseeds (USD 43.3 billion, or 27.1% of the total agricultural imports in 2020), meat, fruits, edible products and preparations, and food products of high nutrient value (Cui and Shoemaker 2018). China is the world's biggest consumer of soybeans and palm oil, see Table S2 in the ESM (for ESM, see the electronic version). For China, international trade in food and agricultural products is not only a source of compensation for the missing volumes of food in the domestic market. It is also a means of preventing and moderating fluctuations in the supply and demand. Thus, food imports are critically important not only from the point of view of the adequate saturation of the domestic market (the availability pillar of the FAO's food security concept), but also from the point of view of ensuring the stability of the food security (the FAO's stability pillar of food security) and smoothing out temporary disruptions in the domestic agricultural production (for example, the increased import of pork amid the mass slaughter of pigs during the African Swine Fever outbreak in 2018–2020) (Mason-D'Croz et al. 2020; You et al. 2021).

The missing volumes of food and the resulting gaps in the production and supply chains are compensated by purchases from around the world. The share that the USA has had in China's agricultural imports has been decreasing since the early 2010s amid the skyrocketing rise of Brazil as an alternative supplier of soybeans and meat (Figure 5).

China-EU agricultural trade. Compared to such large food suppliers to China, such as the USA and Brazil, the share of the European Union (EU) countries in imports looks rather modest (12.85% of the total food supplies to China in 2020). Nevertheless, the EU countries are a critically important source of agricultural imports for China, not only in terms of saturating the domestic market, but also in terms of diversifying the sources of food supply and ensuring the stability of food security. Over the past two decades, the nature of the food trade between China and the EU has radically changed. From being a net exporter in 2000, China turned into a net importer of food and agricultural products from the EU. Imports are growing rapidly against the background of relatively stable exports (Figure 6).

Some scholars suggest that China has reached the maximum volume of exports to the EU, taking the country's available land and other physical agricultural capacity and the degradation of agricultural resources into account (Zhou 2010; Kennedy et al. 2016; Erokhin

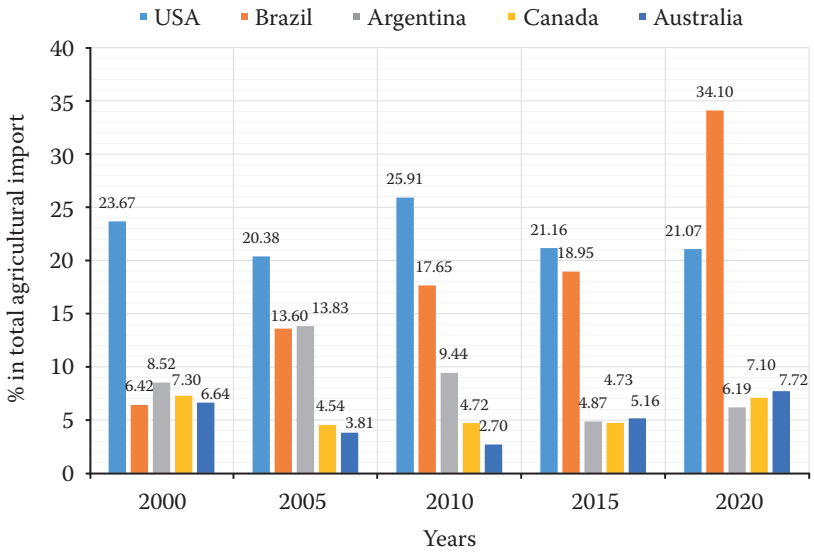

Figure 5. Major suppliers of agricultural products to China in 2010–2020

Source: Authors' own elaboration, based on United Nations Conference on Trade and Development (2022)

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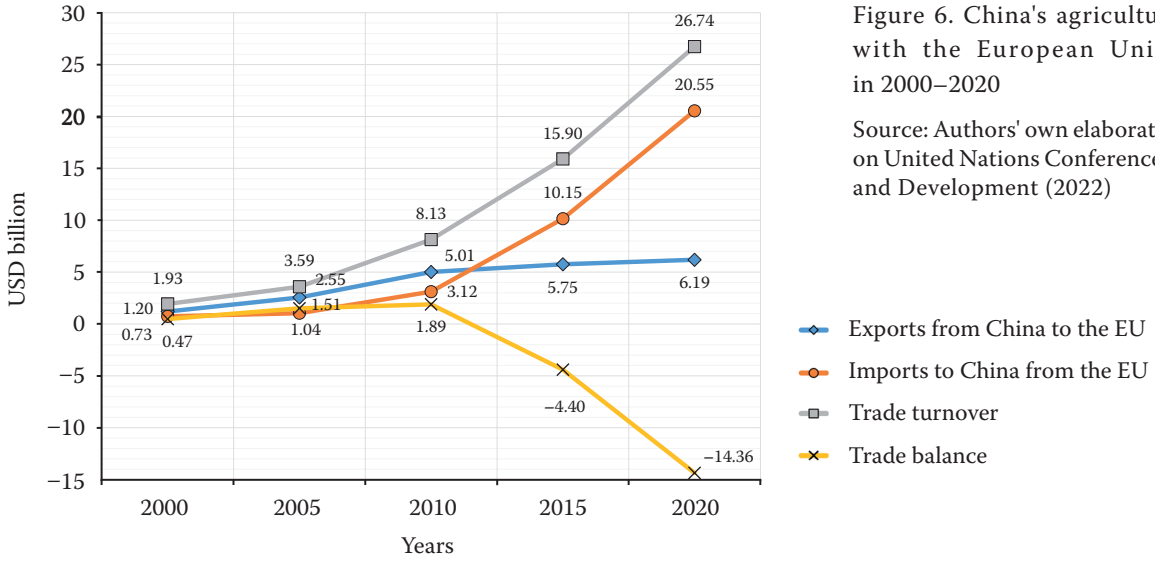

Figure 6. China's agricultural trade with the European Union (EU) in 2000–2020

Source: Authors' own elaboration, based on United Nations Conference on Trade and Development (2022)

2020). The growth of supplies to the EU is due to the intensification of the production of high-value-added products, for China uses investments in labour productivity growth (fruits, edible products and preparations, spices, fish) as described in Table S3 in ESM (for ESM, see the electronic version). The growth of imports from the EU to China indicates the continuing shortage in the domestic market of certain categories of agricultural products, which China can replace only through imports. Major import items for China are meat and edible offal meat (40.88% of China's total agricultural import from the EU in 2020, plus 29.92 percentage points in the structure of agricultural imports compared to 2000) and edible products and preparations (21.56% plus 16.08 percentage points, respectively) (see Table S4 in ESM, for ESM see the electronic version).

Agricultural investment abroad. According to the zero hunger UN Sustainable Development Goal (UN 2020b), investments in agriculture are considered crucial to combat hunger as they contribute to the growth of agricultural production and the establishment of more secure and sustainable supply chains. Currently, China is one of the leading investors in many sectors. In recent decades, China's strategy in the sphere of foreign investment has undergone a distinct transformation – the policy has shifted from the attraction of capital and technologies (1980–1990s) to the encouragement of the 'going abroad' move of Chinese companies (Shambaugh 2013). Paulson (2016) forecasts the aggregated volume of Chinese foreign direct investment (FDI) in various worldwide projects to reach USD 2 trillion in 2015–2025. Agriculture is not among the most popular attractors of the Chinese FDI, but still, in 2017, China accumulated a total investment of USD 17.33 billion in agricultural projects in over 100 countries in the world (State Council 2019). Since the beginning of the 2000s, the Chinese FDI in agriculture has increased under the influence of a combination of factors, including the development and strengthening of Chinese agricultural enterprises, the availability of funds, and support from the government (Erokhin 2019a).

The 'going abroad' approach as one of the directions of the contemporary agrarian policy of China gained impetus due to the scarcity of agricultural resources, primarily, land, in the country. Chinese enterprises have invested in crop production and animal husbandry, fishery and aquaculture, food processing, agricultural machinery, production of fertilisers, seed breeding, and logistics of food and agricultural products.

According to Gro Intelligence (2018), during the past fifteen years, Chinese investors have accumulated over 6.6 million ha of arable land in their projects in Southeast Asia, Africa, Europe, Central Asia, and Oceania. So far, Latin and North America, the biggest suppliers of agricultural products to China, have been rather reluctant to accept Chinese agricultural investment (Figure 7), but China is steadily increasing its participation in joint projects in these regions. The goal is to benefit from the participation on the global system of production, transport, storage, and processing of food and agricultural products (Zhang and Cheng 2016) and in such a way to increase the agricultural output, diversify the sources of food supply, and improve the food security of the country.

As demonstrated in the section above, the implementation of the openness policy widened the gap between

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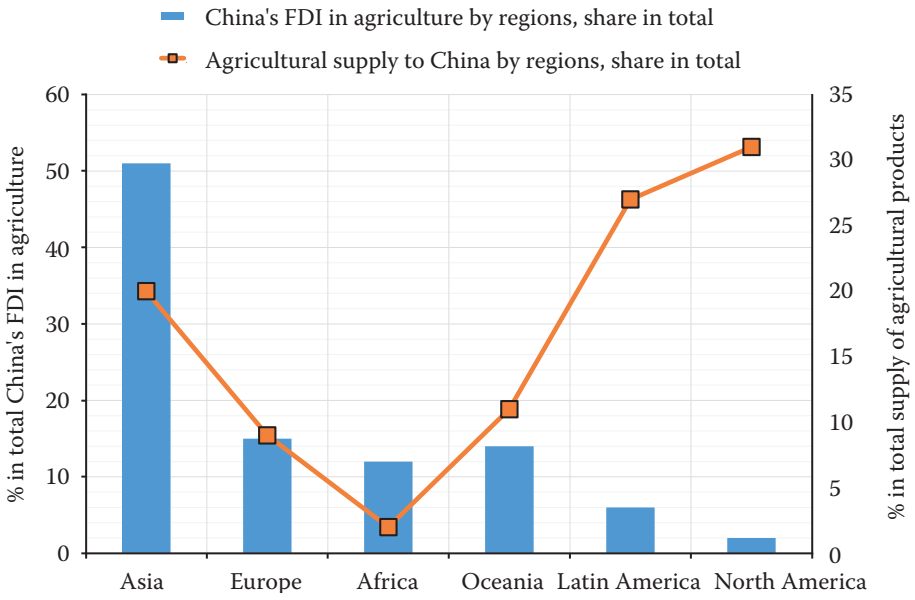

Figure 7. Food supply and foreign direct investment (FDI) in agriculture by regions

Source: Authors' own elaboration, based on National Bureau of Statistics of China (2021) and United Nations Conference on Trade and Development (2022)

the agricultural imports and exports and the emerging trade-related aspects of food insecurity concerns (Gooch and Gale 2018), particularly, after the accession to the WTO in 2001. At that time, the Chinese government responded to the new threat by the approval of the external orientation of the agricultural sector for the development and exploration of land, water, and energy resources in other countries of the world. Such an approach to food security policy as open and external-oriented (State Council 2019) intends to encourage international operations of Chinese agricultural enterprises and improve their competitiveness on the global market. The plan envisages the support and promotion of large-scale high-competitive agricultural holdings for the production of grain, oilseeds, and sugar in Latin America and Africa and a further supply of these products to China to balance the demand and supply on the domestic market.

As of today, China primarily invests in those sectors where Chinese enterprises lack domestic resources to meet domestic demand – oilseeds, grain, meat, and dairy products (Figure 8).

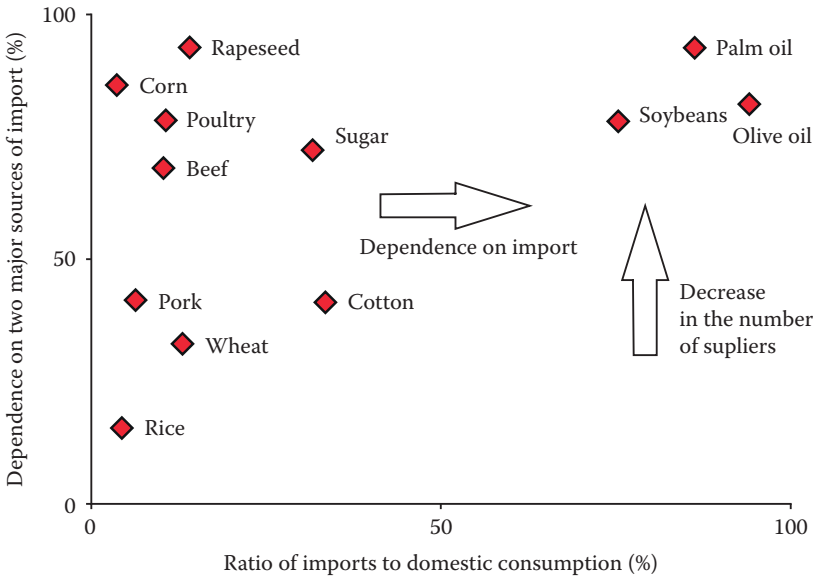

Figure 8. Dependence on imports of selected agricultural products and diversification of imports

Source: Authors' own elaboration

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In the upper right corner, the products for which China's dependence on imports is critically high can be seen, while the supply is provided by a few countries. The most distinct example is China's dependence on the USA as a supplier of soybeans which China is trying to reduce by increasing purchases in Brazil and other countries. Other examples are palm oil from Malaysia and Indonesia and olive oil from Italy and Spain. Such products are the premier targets for Chinese overseas investment. China is now actively investing in the production of oilseeds, including soybeans, in Brazil, as well as acquiring Italian producers and distributors of olive oil.

The upper left field concentrates on the products for which China's dependence on imports is lower, but supply chains are less diversified. The targets on these products are not to reduce the dependence, but to diversify the suppliers. For example, China is nearly self-sufficient in corn (98% of the total domestic consumption is secured by domestic production), but the remaining 2% is supplied by the USA. In recent years, China has attempted to diversify the supply channels by increasing purchases in Ukraine, Bulgaria, and other countries. Another example is rapeseed oil and Canada as its major supplier. The alternative suppliers that China is refocusing on are Russia and Ukraine. The country enjoys low dependence on imports and sufficient diversification of suppliers of rice, wheat, and pork (bottom left corner), but still, there are investment projects in these sectors due to the increasing demand for meat and grains in the Chinese market and the high return on investment.

DISCUSSION

Hunger, poverty, and food demand projection. According to the UN, poverty is a phenomenon that includes not only a lack of income, but also hunger and malnutrition (UN 2020a). Combating poverty is the first of the UN Sustainable Development Goals (UN 2020b) which is tightly connected with the elimination of hunger. The portion of China's population living below the USD 1.9 poverty line declined dramatically from 88% in the 1980s to only 2% in the 2010s. The target to lift all rural people in 128.000 poor villages and 832 counties out of poverty (Erokhin and Gao 2019) was achieved in 2020. The five-year plan on poverty alleviation focused on the development of food and agricultural production in rural areas, support of competitive industries, and diversification of income opportunities for rural people.

The improvement in the living standards has shifted the food consumption pattern towards higher-nutrient and higher-quality foods (Zhou 2010; Zhou et al. 2014). The *per capita* consumption of meat, vegetables, dairy and seafood products, and fruit has increased substantially. The current average daily *per capita* intake is 2 172 kcal, the contribution to the intake from carbohydrates has decreased while that from fats and proteins has increased. Thus, the ongoing improvement in the living standards has contributed to the increase in the demand for high-nutritious and added-value food and agricultural products (Gro Intelligence 2018). The World Bank (2018) expects the continuing economic growth in China to result in increasing the demand for major crops and other products in 2020–2050 (meat, milk, oilseeds, etc.) (Figure 9). Nath et al. (2015) and Gao (2017) expect that in order to meet the rising demand (300 million tonnes of corn and 190 million tonnes of soybean annually), China would need to increase land under crops by 21% by 2030.

In light of such a transformation in the food consumption pattern, Huang et al. (2017) forecast a decrease in the food self-sufficiency of China down to 91% by 2025 due to the limited capacity of China's agricultural sector to increase the volume of the domestic output. The substantial increase in crop production is restricted by the scarcity of land resources and their degradation. So far, yield gains in China have been largely obtained through the overuse of pesticides and fertilisers, which aggravated the environmental problems and compromised the food safety (Kennedy et al. 2016). To combat this food safety problem, the government has introduced a set of measures, for example, subsidies to farmers to incentivise the use of high-quality seeds and more productive varieties and breeds (Liu et al. 2012; Yi et al. 2015). However, structural policy measures are still required in the light of the achievement of food security over a long-term perspective.

Sustainable food security and zero hunger. In October 2019, China's government released the National Food Security Strategy, a long-term perspective vision of food security and zero hunger policies of the country (State Council 2019). Based on the national specifics of agricultural production, availability of land and other natural resources, and development tendencies at the domestic food market, in this document, China declared its commitment to the ensurance of food security by means of the implementation of the concept of innovative, coordinated, ecological, open, and comprehensive development (Erokhin and Gao 2019).

The Strategy emphasises seven key factors of sustainable food security: development of production capacities, particularly, in crop production; strengthening

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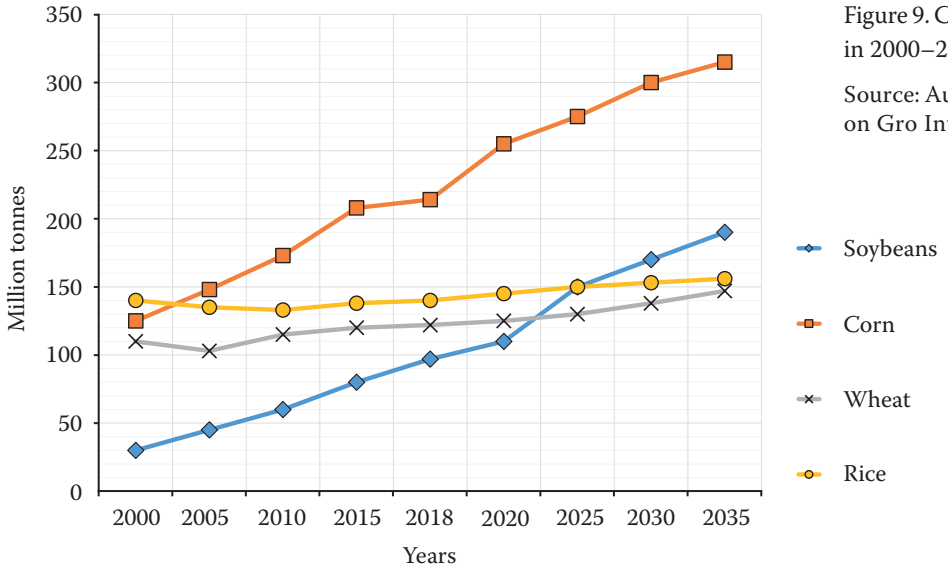

Figure 9. China's demand for major crops in 2000–2020 and projection till 2035

Source: Authors' own elaboration, based on Gro Intelligence (2018)

management and operations in the agricultural sector in accordance with the law; support and protection of domestic farmers and encouragement of agricultural production; innovation-based development of domestic food market and food supply chains; improvement of performance and efficiency of macroeconomic regulations in agriculture; development of value-added food production and processing; and the establishment of a comprehensive system of research and technological innovations in the crop sector and animal husbandry. The development of the production capacity goes in line with the overall focus of China's food security policy on securing the food availability (Erokhin and Gao 2019). It aims at increasing the output and includes the rational utilisation of scarce agricultural lands, the protection and improvement in the production quality of the lands and soil fertility, better use of water resources, and the establishment of so-called 'functional zones' for the production of staple crops, primarily, grains (Gao et al. 2018). The government is aimed at the furtherance of innovation development and the introduction of advanced technologies, solutions, and farming methods with regards to crop production and animal husbandry.

The disruption of supply chains amid the COVID-19 outbreak has substantially aggravated the worldwide food security problem (Erokhin et al. 2021). International food markets have become increasingly volatile due to the distorting lockdown and protectionist measures introduced by most governments worldwide. China introduced a ban on the transportation of live poultry, frozen meat, fish, and other products (International Food Policy Research Institute 2020) amid evidence of COVID-19 transmission through cold supply chains (Bennett et al. 2020; White et al. 2020). In such an uncertain market environment, neither the establishment of true security nor combating hunger in any particular country is possible without coordination efforts with the global community. By supporting the in-pandemic resilience of food supply chains and international cooperation in agriculture, China has emerged as one of the key actors in the global governance in the sphere of food security, as well as making a substantial contribution to globally combating hunger. The National Food Security Strategy emphasises four strategic directions of China's policy in the spheres of the establishment of sustainable security in major food and agricultural products and the achievement of a zero-hunger status: the higher productivity of crop production and animal husbandry; the establishment of sufficient reserves of food and agricultural products, primarily, staple grains; the development of a modern grain circulation system and, broadly, efficient and stable food supply and value-added chains; the contribution to the solution of global problems of food insecurity and hunger. In general, the strategic directions of China's food security policy match the SDGs in the spheres of combating hunger, establishing food security, improvement in nutrition, and ensurance of the sustainable development of food and agricultural production.

CONCLUSION

Since the early days of reforms in the 1970s, China has transitioned from rural poverty, food shortages, and hunger to self-sufficiency in staple food and ag-

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ricultural products. However, despite such remarkable achievements, the sustainability of food security is now challenged by the COVID-19 pandemic, environmental problems, scarcity of land resources, growing dependence on food imports, and the low diversification and disruption in the food supply chains due to lockdowns. In this study, the authors demonstrate that China's agricultural imports have increased amid the shifting consumption patterns towards more qualitative foods of higher nutrient value. New challenges in establishing food security have arisen as the increase in the demand is associated with the degradation of arable lands and shrinking capabilities for the domestic agricultural sector.

The responses to these new challenges to the food security include the creation and improvement of the conditions for the sustainable development of agricultural production (self-sufficiency, or the availability pillar in the FAO's food security pattern) coupled with the reduction in the poverty and increasing living standards (accessibility), combating hunger (utilisation), and the support of domestic agricultural producers in their overseas projects (stability of food supply, reduction of dependence on food imports, and diversification of supply chains).

Among the factors of sustainable food security, the authors discuss the development of production capacities in China's agricultural sector and abroad, the improvement in agricultural management systems, the introduction of innovations to conventional farming, and the development of value-added food production and processing. These efforts will allow China to increase its output, establish sufficient reserves of staple foods, improve the supply chain sustainability, and contribute to a reduction in the rural poverty, hunger, and food insecurity both worldwide and in China.

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