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SCIENTIFIC ARTICLE

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China's Agri-Food Trade in a Shifting Global Landscape: Policies, Lessons, and Challenges

ABSTRACT

This paper examines the evolution of China's agri-food trade over the past two decades amid increasing global uncertainty. Using a combination of quantitative trade data and qualitative policy analysis from 2000 to 2023, it explores how China has navigated crises such as the global financial crisis, the COVID-19 pandemic, and geopolitical tensions. The findings highlight that China's agri-food trade growth has been driven by trade liberalisation, domestic support policies, and a strategic focus on diversification and food security. However, challenges remain, including heavy import dependence, rising production costs, and environmental pressures. The study concludes that strengthening domestic capacity, investing in green innovation, and expanding trade partnerships are critical for long-term food system stability. These insights offer valuable lessons for other agricultural economies striving for greater resilience in a volatile global environment.

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Introduction

Global trade has played a vital role in ensuring food security, driven largely by sustained trade expansion. The share of agricultural products in global trade has steadily increased over the past two decades, rising from an average of 15% in 2000 to 23% in 2023, indicating that trade has grown faster than agricultural production (OECD/FAO, 2024). However, recent years have seen the emergence of significant challenges, including rising anti-globalisation sentiment, the COVID-19 pandemic, and escalating geopolitical tensions that have profoundly impacted food trade. For instance, the United States imposed additional tariffs on imports from multiple countries to protect domestic industries, triggering widespread trade frictions. Geopolitical conflicts, such as instability in the Middle East and the Russia–Ukraine war, have further disrupted food production and trade. These shocks have led to heightened price volatility in global food markets, the proliferation of trade barriers, and widespread supply chain disruptions, posing serious risks to food security and social stability worldwide.

As a major actor in the global agri-food system, China has played a pivotal role in this evolving landscape. Over the past decade, China has accounted for 28% of the global growth in food and agricultural consumption (OECD/FAO, 2024). During this period, the country transitioned from a net exporter to the world's largest agricultural importer, reflecting both surging domestic demand and a broader commitment to trade liberalisation. Amid the shifting dynamics of global trade, China's agri-food sector now faces a complex set of new challenges.

Since China's accession to the World Trade Organization (WTO), a large body of research has examined the evolution of its agricultural trade, including structural trends, the effects of external shocks, and the role of trade and domestic policy measures. Notably, scholars have analysed post-WTO reforms such as significant tariff reductions, the removal of non-tariff barriers (Ni *et al.,* 2016), and a strategic reorientation toward market-based resource allocation (Martin, 2001). These reforms aligned China's policies with global trade norms and aimed to mitigate emerging challenges.

Trade liberalisation has produced mixed outcomes. On the one hand, the surge in agri-food imports has reduced self-sufficiency for certain commodities and exerted competitive pressure on domestic farmers, especially due to price differences with low-cost foreign products. On the other hand, imports have allowed China to capitalise on comparative advantages, easing domestic resource and environmental constraints. For example, agricultural trade has enabled the importation of "virtual" land and water, saving an estimated 3.27 million hectares of global cropland annually from 1986 to 2009 (Qiang *et al.,* 2013). Moreover, trade-driven export growth and rising non-farm incomes have contributed significantly to rural poverty reduction (Huang *et al.,* 2007).

Nonetheless, the global agri-food trade environment has become increasingly volatile in recent years. The 2018 U.S.–China trade war disrupted agricultural sectors in both

countries, reshaped trade flows, and increased carbon emissions due to rerouted supply chains (Elobeid *et al.,* 2021). The COVID-19 pandemic further strained global agri-food logistics and disrupted the livelihoods of nearly 70% of China's migrant workforce (Cao *et al.,* 2020; Zhang *et al.,* 2021). While markets have shown adaptive capacity in the face of climate change, the complexity of overlapping risks continues to grow (Xie *et al.,* 2020). These shocks have prompted global reassessments of trade interdependence and food security strategies.

In response, scholars have increasingly analysed the evolution of China's agri-food trade policies, assessing their effects on trade patterns, domestic production, and food security (Gale, 2013; Huang *et al.,* 2010, 2017; Li *et al.,* 2016; Yu *et al.,* 2010; Zhu *et al.,* 2018). This body of literature underscores the multifaceted implications of China's agricultural trade for both domestic socio-economic systems and global food networks. It also highlights the importance of policy instruments in navigating the tension between competitiveness, sustainability, and food security amid growing uncertainty.

Against this backdrop of intensifying geopolitical tensions and climate-related risks, a systematic and forward-looking review of China's agri-food trade policies is urgently needed. This paper provides a comprehensive analysis of China's agri-food trade policy development since WTO accession, synthesising key experiences and lessons to inform future policy responses in China and other countries confronting similar uncertainties.

Methodology

This study employs both quantitative and qualitative methods to analyse China's agri-food trade patterns and the evolution of related policies from 2000 to 2023. Trade data were sourced from UNCTADstat and FAOSTAT, with a focus on primary agricultural commodities and processed food products. The quantitative component assesses trends in trade volumes, self-sufficiency ratios, and the diversification of trade partners. The qualitative analysis draws on policy documents, academic literature, and government reports to examine the rationale behind China's trade-related measures and their policy impacts. In addition, the study includes case analyses of key policy transitions, such as WTO accession, the implementation of domestic support measures, and recent diversification strategies, to illustrate the changing policy landscape.

To assess the international competitiveness of China's agri-food products, the study utilises the Revealed Comparative Advantage (RCA) index for major agricultural goods from 2000 to 2023, based on data from UNCTADstat. The RCA index is a widely used indicator that measures the degree of export specialisation and comparative advantage of a particular product in international trade. It is calculated by comparing the share of a product in a country's total exports with its share in global exports, thus reflecting the relative competitiveness of that product in the international market. The RCA formula is expressed as:

$$RCA_{ij} = \frac{X_{ij}/X_{tj}}{X_{iw}/X_{tw}} \quad (1)$$

where:
X_{ij} = Export value of product i from country j
X_{tj} = Total export value of country j
X_{iw} = Global export value of product i
X_{tw} = Total global export value

The numerator represents the share of the product in the country's total exports, indicating its relative domestic export emphasis, while the denominator represents the product's share in total global exports, serving as a global benchmark. An RCA value greater than 1 indicates that the country has a comparative advantage in that product and is competitively positioned as an exporter. The higher the RCA index, the stronger the country's export advantage in that specific product.

Agri-Food Trade Situation in China

This paper compiles data on China's agricultural and food trade from 2000 to 2023, sourced from UNCTADstat, encompassing both primary agricultural commodities and processed food products. The dataset is used to examine the structural characteristics and long-term trends in China's agri-food trade since its accession to the WTO.

Over the past two decades, China's agricultural imports have grown rapidly, positioning the country as the world's largest importer of agricultural products, while export growth has remained comparatively modest (Figure 1). Between 2000 and 2023, agricultural imports rose sharply from USD 8.07 billion to USD 209.82 billion, whereas exports increased from USD 13.37 billion to USD 78.56 billion. This shift reflects China's transformation from a net agricultural exporter to a nation with a persistent and widening trade deficit in agri-food products, which reached USD 131.26 billion in 2023. The surge in imports following WTO accession, combined with relatively slow export growth, resulted in the transition from a trade surplus to a sustained deficit beginning in 2008.

China's share in global agricultural trade has also expanded significantly. Its share of global agricultural imports rose from approximately 2% in 2000 to 11.9% in 2023, firmly establishing China as the world's leading importer. In contrast, its share of global agricultural exports increased only modestly, from 3.5% to 4.5% over the same period—underscoring the growing imbalance between import and export dynamics.

The composition of China's agri-food trade reveals a persistent structural imbalance (Figure 2). This pattern highlights China's continued reliance on imports of land- and capital-intensive commodities such as soybeans, meat, cereals. Meanwhile, China's primary agricultural exports remain largely labour-intensive, including vegetables, edible preparations, fish, and shellfish. These trends point to underlying structural weaknesses in China's agri-food trade system, particularly its heavy dependence on imported

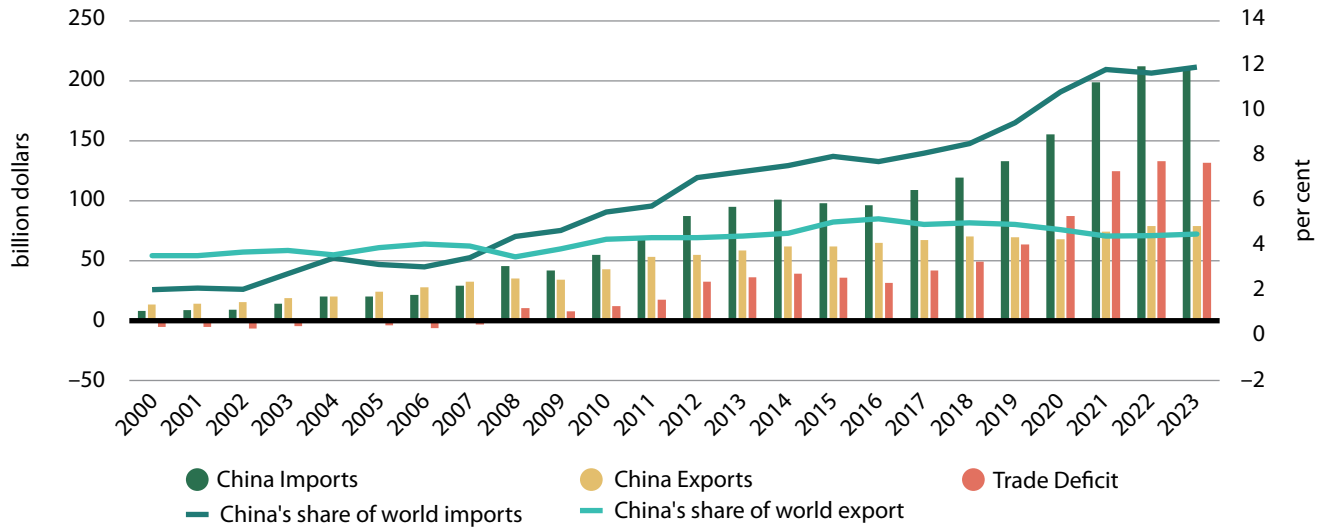

Figure 1: China's agri-food trade volume and its global share.

Source: Own composition based on UNCTADstat (2025)

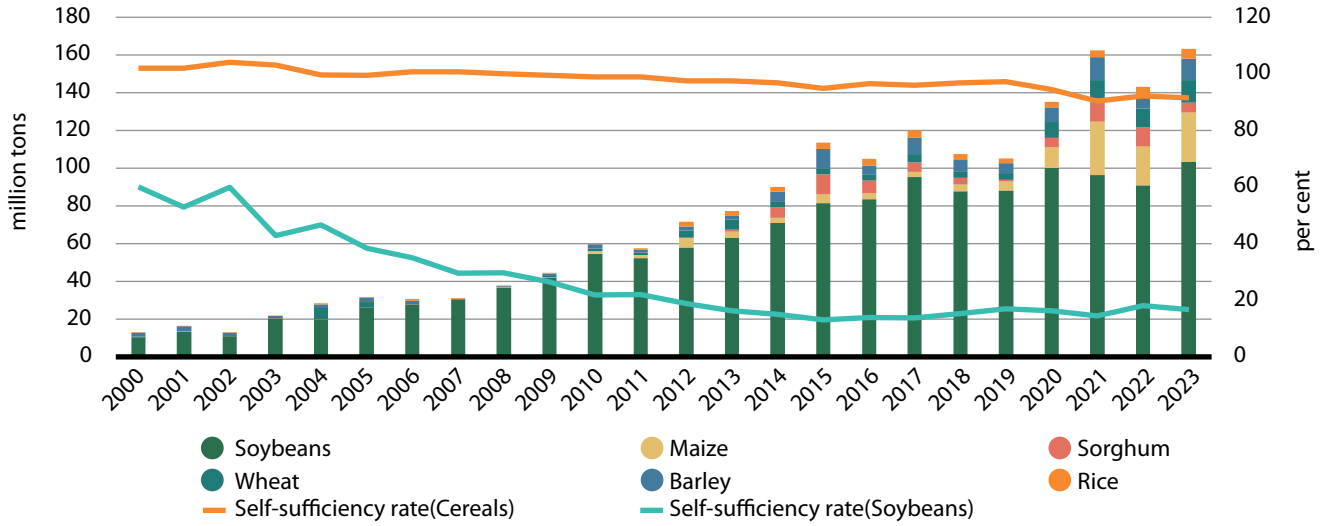

Figure 2: China's Imports and Self-sufficiency in Cereals and Soybeans.

Source: Own composition based on UNCTADstat (2025)

essential commodities and its limited advancement in exporting higher value-added agricultural goods. While both imports and exports of agricultural products have increased significantly over the past two decades, raw products dominate imports, whereas processed foods account for a larger share of exports. Raw products made up more than 60% of total imports and remained relatively stable, while their share of exports declined below 40% and reached 28.9% by 2023. This reflects the imbalanced nature of China's agricultural sector, which remains heavily reliant on labour-intensive production while depending on foreign markets to meet demand for land- and capital-intensive goods.

Since 2000, soybeans have consistently been China's most critical imported agricultural commodity, representing nearly one-quarter of total agri-food imports each year and accounting for approximately 50% around 2008. In 2000, China imported 10.42 million tons of soybeans worth USD 2.27 billion; by 2023, imports had surged to 103 million tons valued at USD 59.44 billion. Other major imports in 2023 included fruits (USD 16.7 billion), beef (USD 14.43 billion), vegetable oils (USD 12.72 billion), and corn (USD 9.03 billion). On the export side, vegetables, fruits, poultry, rice, and nuts were the top contributors, with export values in 2023 reaching USD 12.24 billion, USD 6.6 billion, USD 2.17 billion, USD 1.97 billion, and USD 1.42 billion, respectively.

While China's cereal imports have increased in recent years, the self-sufficiency rate has remained relatively stable. Imports rose from 3 million tons in 2000 to 52.2 million tons in 2022, while the self-sufficiency rate declined only modestly, from over 100% in 2000 to approximately 91.7% in 2023. This stability can be attributed to continued growth in domestic cereal production, which rose from 401 million tons in 2000 to 641 million tons in 2023. In stark contrast, soybean imports have increased dramatically, accompanied by a sharp drop in self-sufficiency. In 2000, China produced 15.41 million tons of soybeans and imported 10.21 million tons. By 2023, domestic production had risen modestly to 20.84 million tons, while imports surged to

103.38 million tons, resulting in a self-sufficiency rate of just 16.8% in 2023, down from approximately 60% in 2000. This trend underscores China's growing dependence on global markets for soybeans, with domestic production now contributing only a small fraction of national demand (Figure 2).

China's meat imports began to increase rapidly around 2011, accompanied by a noticeable decline in self-sufficiency (Figure 3). In 2010, domestic meat production reached 73.92 million tons, while imports stood at just 403,000 tons, resulting in a self-sufficiency rate of 99.45%. By 2023, although production had risen to 97.48 million tons, imports had surged to 7.16 million tons, reducing the self-sufficiency rate to 93.1%. China's meat imports are concentrated primarily in beef and pork, with significantly lower demand for chicken and goat meat from international markets.

Finally, we estimated the self-sufficiency rates of macronutrients by combining trade volumes, production data, and food composition tables. The results are shown in Figure 4. Over the past two decades, nutritional self-sufficiency has declined noticeably: energy fell from 99.3% in 2000 to 84.8% in 2022; protein from 95.3% to 73.8%; and fat from 95.9% to 80.0%. These trends reflect both a growing reliance on international markets and shifting dietary preferences among Chinese consumers.

China's sources of agri-food imports have exhibited a notable trend toward diversification, characterised by a discernible decline in dependence on the United States and a substantial increase in imports from Brazil (Figure 5). Prior to 2012, the proportion of agri-food imports sourced from the United States remained at approximately one-quarter, positioning it as the primary origin of China's agri-food imports. After this period, there was a gradual reduction in imports from the United States, with a shift toward other countries and regions. Notably, until the 2018 U.S.-China trade war, approximately 20% of China's agri-food imports still originated from the United States; this trade conflict served as a catalyst prompting a significant reduction in imports from the United States. In contrast, China's imports from Brazil have witnessed a dramatic increase, rising from $503 million in 2000 to $56.75 billion in 2023. This growth has elevated Brazil's share of China's agri-food imports from 6.2% to 27%, establishing it as the largest source of China's agri-food imports. Additionally, other Asian

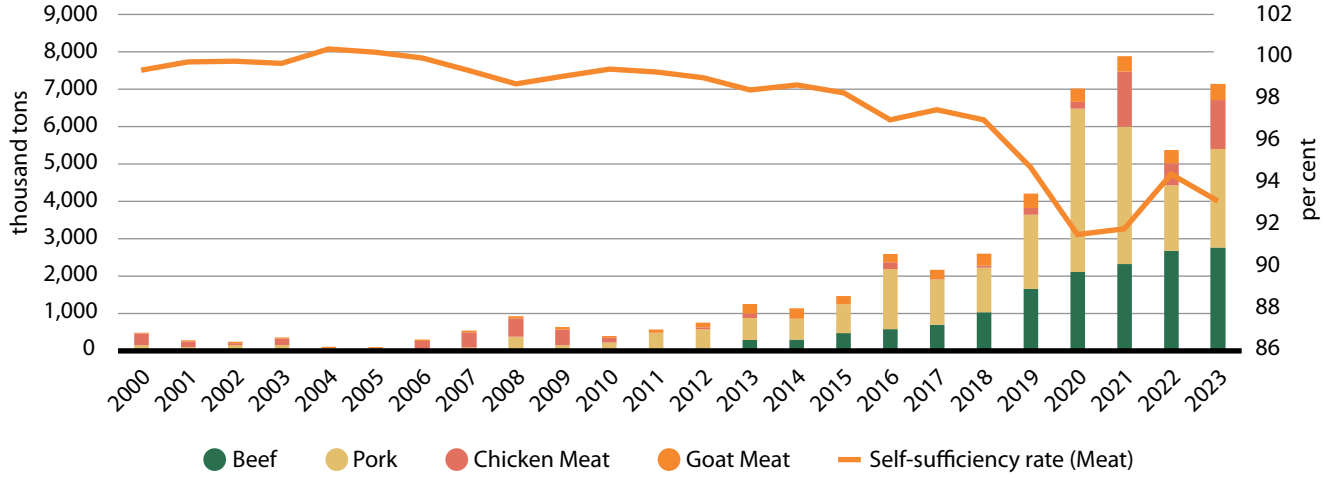

Figure 3: China's Imports and Self-sufficiency in Meat.

Source: Own composition based on UNCTADstat (2025)

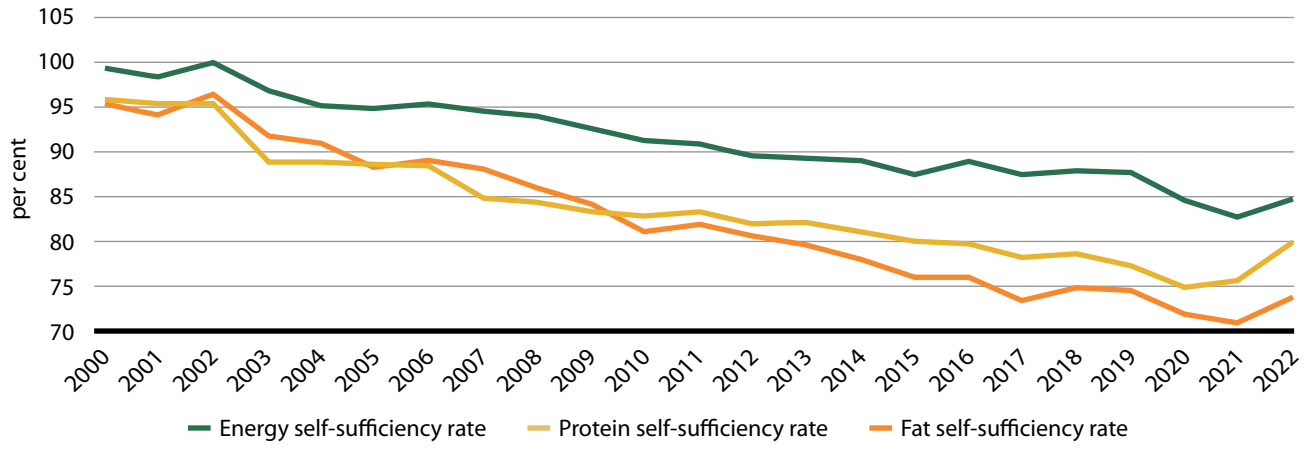

Figure 4: China's self-sufficiency rate of nutrient composition.

Source: Own composition based on UNCTADstat (2025)

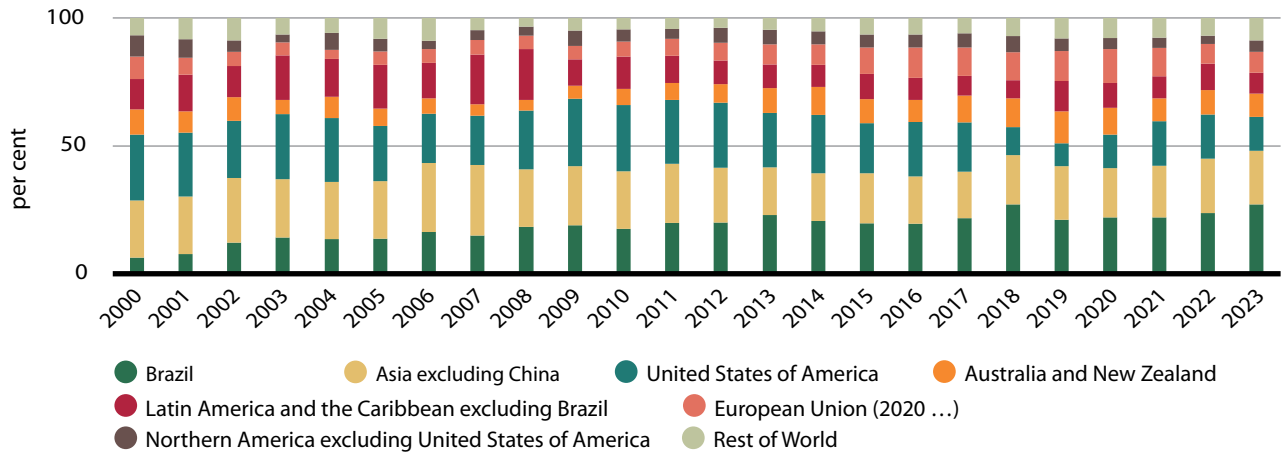

Figure 5: China's Agri-food Imports Sources.
Source: Own composition based on UNCTADstat (2025)

countries have emerged as important contributors to China's agri-food import portfolio. Collectively, these developments underscore the increasing diversification of China's agri-food import sources, with the shares of major origins evolving toward a more balanced distribution.

Together, these findings highlight three key patterns: (1) the rapid expansion and structural transformation of China's agri-food trade; (2) a growing concentration of imports in a few key commodities, particularly soybeans; and (3) increasing diversification of trade partners to mitigate geopolitical risks. These trends reflect the complex trade-offs China must navigate between safeguarding food security, supporting domestic production, and deepening integration into global markets.

Evolution of China's agri-food (and trade) policies

The evolution of China's agri-food trade has closely mirrored shifts in its trade policy, which has undergone several major transformations since the early 2000s. China's accession to the WTO in 2001 marked a pivotal moment, ushering in a period of rapid growth in agri-food trade. In the years following WTO entry, China introduced domestic support policies in 2004 aimed at protecting and strengthening its agricultural sector, which temporarily slowed import growth. Around 2010, in response to rising production, stockpiles, and imports, the country began implementing market-oriented reforms. These reforms, which gained momentum around 2012, allowed market forces to play a greater role and helped moderate import growth. Since 2015, China has actively pursued a trade diversification strategy that has expanded overall trade volumes while reducing dependence on a limited set of trading partners.

Figure 6 illustrates the evolution of China's agri-food trade policies since its accession to the WTO. This chapter offers a detailed analysis of each policy and the context in which it was implemented. These policy shifts were not merely reactive but part of a strategic response to domestic modernisation goals and global economic changes. They reflect an evolving approach aimed at balancing national development priorities with deeper integration into the global economy. The following subsections examine the major phases and instruments of China's agri-food trade policy since WTO accession, highlighting their motivations, mechanisms, and impacts.

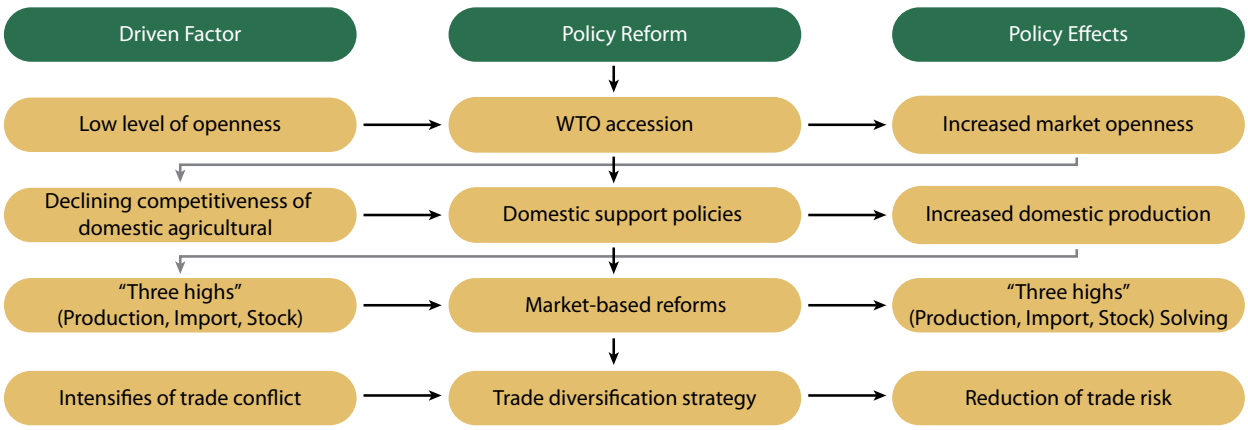

Figure 6: Evolution of China's agri-food trade policy.
Source: Own composition

WTO Accession: A Major Turnaround in Agri-food Trade Policy

China's formal accession to the WTO in 2001 marked a new era in its agri-food trade policy. One of the most significant changes was a sharp reduction in import tariffs, which fell from an average of around 40% in the 1990s to approximately 15% after accession. For example, soybean tariffs were cut to just 3%, in effect fully liberalising that market. China's agricultural subsidy policies became subject to WTO disciplines, allowing the implementation of constrained "Yellow Box" policies, unconstrained "Green Box" policies, and "Blue Box" policies. Among these, the "Yellow Box" policies are subject to the Aggregate Measure of Support (AMS), which cannot exceed 8.5% of output value (WTO,2001).

These reforms expanded market access, boosted imports, and established China as a major player in global agri-food trade. WTO membership also opened export opportunities for labour-intensive products, such as vegetables and fruits, where China holds comparative advantages. However, it also exposed domestic producers to intensified competition from lower-cost imports, particularly from developed economies like the United States and the European Union. To manage the risks associated with liberalisation, China introduced tariff-rate quotas (TRQs) on sensitive products, such as rice, wheat and maize, helping to stabilise domestic supply and prices while facilitating integration into global markets.

Domestic Support Policies: Enhancing Agricultural Competitiveness

China implemented a series of domestic support measures to offset rising production costs and protect farmer incomes since 2004. These measures included direct subsidies for grain farmers, input subsidies for seeds, fertilisers, and machinery, as well as substantial investments in rural infrastructure such as irrigation and transportation.

A key component of this support system was the Minimum Purchase Price (MPP) programme for staple grains like wheat and rice. Under this mechanism, government entities, primarily the China National Grain Reserve Corporation, purchased grain when market prices fell below a set threshold, helping to stabilise farmer incomes and maintain production during periods of price volatility.

From 2007 onward, temporary storage programmes for commodities such as corn, soybeans, and cotton were introduced to manage surpluses, prevent price collapses, and stabilise markets. These efforts, together with infrastructure improvements, enhanced agricultural productivity and resilience, while supporting more efficient trade and distribution.

Collectively, these domestic policies strengthened the competitiveness of China's agricultural sector by improving production efficiency and quality. They boosted China's export capacity and reduced dependence on imports, thereby reinforcing the country's bargaining power in international trade.

Market-Oriented Reforms: Pursuing Efficiency and Sustainability

With the development of China's economy, farmers have migrated to urban areas for employment, leading to rising agricultural labour costs. Coupled with increased agricultural subsidies, domestic agricultural production costs have risen, driving up prices. However, this has also resulted in an expansion of price differences between domestic and international markets. Market prices for most Chinese agricultural products tend to be higher than international prices, necessitating substantial imports to meet domestic demand. Figures 7 and 8 compare domestic and international prices for several crops and livestock products, respectively. Together, they reveal that prices for Chinese agricultural products began rising sharply around 2010. During this period, domestic agriculture faced the so-called "three highs" phenomenon: high import, high production, and high stock (Zhu *et al.,* 2021).

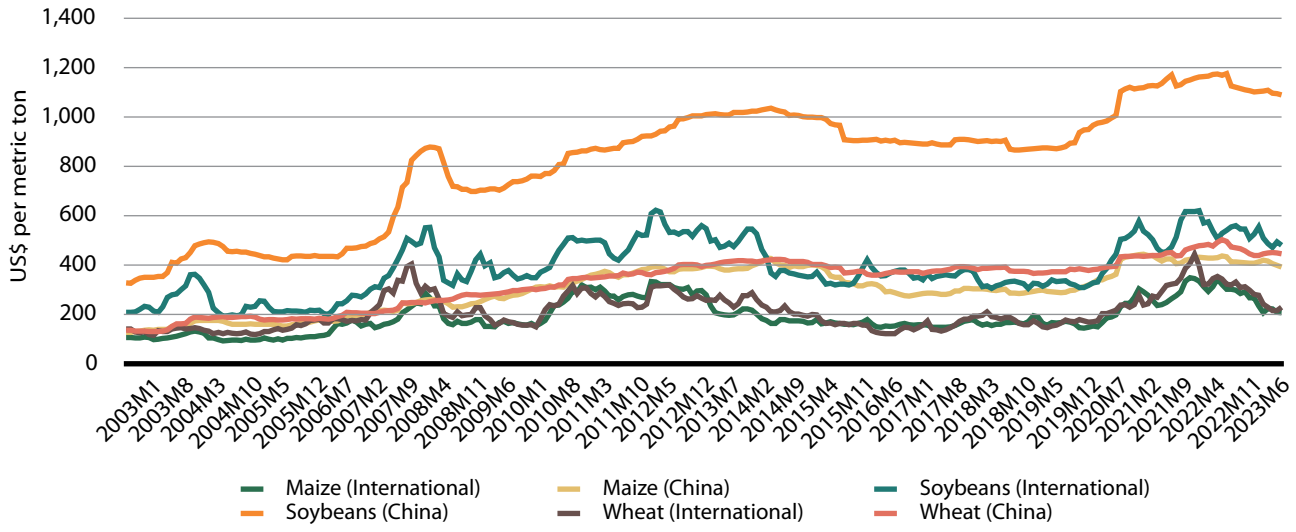

Figure 7: Price comparison of selected grains and soybeans.

Source: China National Bureau of Statistics (CNBS) and IMF (2025) data

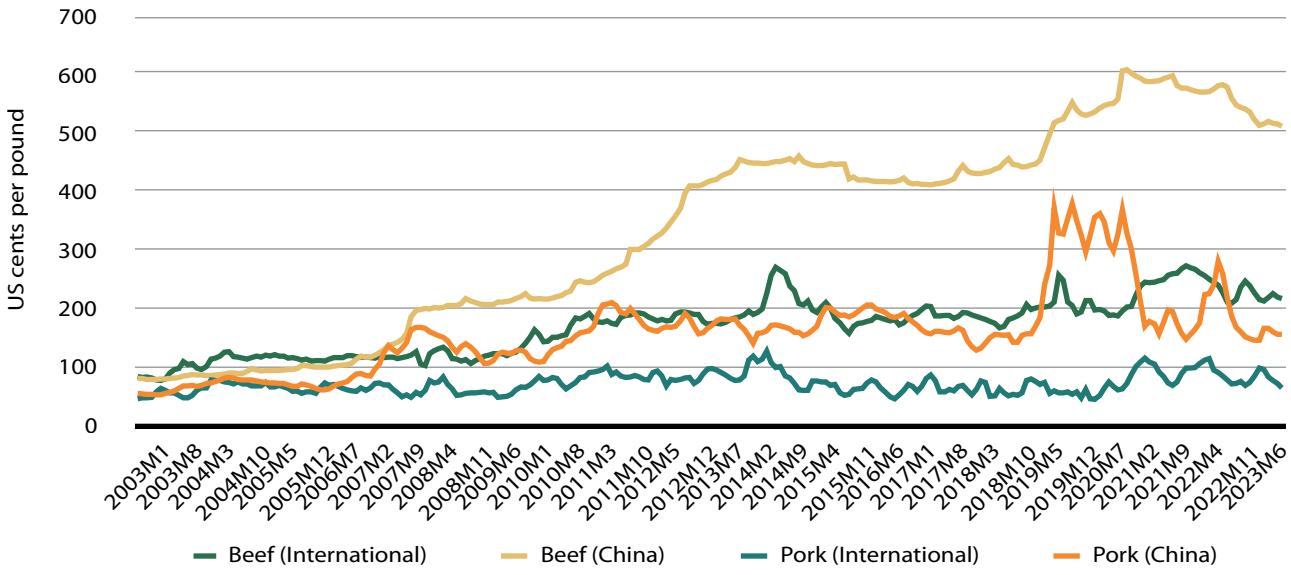

Figure 8: Comparison of prices of selected livestock products.
Source: China National Bureau of Statistics (CNBS) and IMF (2025) data.

In response, starting around 2010, China launched market-oriented reforms to address inefficiencies and ease the fiscal burden of extensive state intervention. This involved phasing out temporary storage policies and adjusting minimum purchase prices, allowing market forces to play a greater role in price determination. For example, floor prices for wheat and corn were gradually lowered to introduce more pricing flexibility. As shown in the figures, prices started to stabilise around 2014, signalling the initial effectiveness of these reforms. Notably, the international and domestic prices of corn and wheat closely mirror each other, with nearly identical trends, reflecting strong substitutability between these two staple grains. In contrast, soybean prices are considerably higher than those of corn and wheat, although their overall price trends show similar patterns.

At the same time, China significantly increased investment in agricultural innovation. Advances in precision farming, seed development, and post-harvest technologies enhanced productivity while minimising environmental impact. These reforms marked a strategic shift from quantity-driven to quality-oriented trade.

Sustainability also became a key focus. Programmes promoting soil testing, formula fertilisation, organic alternatives, and manure recycling were implemented to reduce agricultural pollution and improve environmental outcomes. These initiatives helped align trade expansion with ecological objectives.

Trade Diversification: Expanding International Market Reach

In response to rising protectionism and global geopolitical uncertainties, China has intensified efforts to diversify its agri-food trade. The Belt and Road Initiative (BRI), launched in 2013, has become a key platform for building trade partnerships. Through bilateral agreements, demonstration zones, and agricultural technology exchanges, China has strengthened ties with Southeast Asia, Central Asia, and Africa.

Regional agreements have further supported diversification. The Regional Comprehensive Economic Partnership (RCEP), signed in 2020, established a vast free trade zone across the Asia-Pacific. Earlier, the China-ASEAN Free Trade Area, completed in 2010, deepened trade within the region. Additionally, bilateral free trade agreements (FTAs) with countries such as Chile, Pakistan, and Australia have opened new markets for agri-food products (Ministry of Commerce of China, 2025).

Complementing these agreements, China has hosted major trade expositions, including the China International Import Expo and the Agricultural Products Trade Fair, to attract global suppliers and promote export opportunities for domestic producers.

Together, these initiatives have reshaped China's agri-food trade by broadening sourcing options, reducing overreliance on specific markets, and embedding the country more deeply into global value chains.

On the whole, China's agri-food trade experience over the past two decades presents a compelling mix of strategic achievements and important lessons. This section synthesises the key insights relevant to national policy development as well as broader international efforts to enhance food security and trade resilience.

Strategic Achievements

Trade Enhances Nutrition and Alleviates Environmental Pressure

China's deeper integration into global agri-food trade has markedly enhanced dietary diversity and nutri-

tional outcomes. Since joining the WTO, the country has increased imports of premium, nutrient-rich foods-such as tropical fruits, dairy products, and high-quality meats, to meet growing demand for healthier diets. Trade liberalisation has helped lower food prices and expand access to nutritious products, thereby supporting improved public health.

Simultaneously, trade has eased pressure on domestic natural resources. The large-scale importation of land- and water-intensive commodities like soybeans has effectively outsourced some of the environmental costs of production. These imports represent "virtual" savings in arable land and water use (Ali *et al.,* 2017), helping China curb overuse of fertilisers, irrigation, and farmland, particularly in ecologically sensitive areas.

Trade Policy Drives Agricultural Modernisation

Strategic openness to trade has been a key driver in modernising China's agricultural sector. Access to international markets has incentivised the adoption of advanced technologies, including precision agriculture, improved seed varieties, and modern supply chain logistics. These advancements have significantly boosted productivity and raised rural incomes.

Complementing trade openness, domestic policy tools such as subsidies, minimum price mechanisms, and infrastructure investments have strengthened the competitiveness of China's agricultural products. China's strong focus on staple grain self-sufficiency, supported by measures like tariff-rate quotas and the "Storing Grain in Land and Technology" strategy, has helped maintain resilience in the face of global shocks, including the 2008 financial crisis.

Diversification and Reserves Strengthen Resilience

China's trade diversification strategy has broadened sourcing options and reduced dependence on a limited number of trade partners. By enhancing ties with countries along the Belt and Road Initiative and deepening regional cooperation through agreements such as the RCEP, China has secured alternative supply routes for critical commodities.

These efforts are supported by a robust grain reserve system, which employs advanced storage technologies and multi-tiered stockpiling. This system helps buffer against price volatility and supply disruptions. For example, during the COVID-19 pandemic and the global fertiliser shortage in 2022, China's reserves played a vital role in stabilising domestic food availability and prices. Together, diversified imports and reliable reserves have reinforced China's position as a stabilising force in global agri-food markets.

Persistent Challenges and Lessons Learned

Despite these accomplishments, China's agri-food trade strategy has encountered several challenges.

Slow Structural Adjustment

Despite rapid trade expansion, China's agricultural export structure remains concentrated in low-value, labour-intensive goods. Meanwhile, high-value imports such as dairy and oilseeds dominate the import mix. This imbalance, compounded by rising labour and input costs, continues to erode the competitiveness of China's agricultural exports (Ni *et al.,* 2018).

Domestic Market Vulnerability

Trade liberalisation has increased China's exposure to external shocks and market volatility. Events like the 2008 financial crisis and the 2018 Sino-U.S. trade tensions have disrupted domestic markets, reducing farmer incomes and amplifying risks in key sectors. This underscores the challenge of balancing consumer benefits from cheaper imports with the need to protect domestic producers.

Environmental Impacts of Intensification

China's trade-linked agricultural intensification has led to significant environmental costs. Rising feed demand, particularly for livestock, has overwhelmed manure management infrastructure, leading to pollution. Monoculture practices driven by import demands have degraded soil health and reduced biodiversity. These outcomes threaten the long-term sustainability of China's agri-food system.

Future challenges

Despite impressive achievements in expanding trade volumes, optimising import structures, and strengthening global influence, China's agri-food trade now faces a new era of heightened uncertainty. Political tensions, shifting supply-demand dynamics, domestic policy limitations, and accelerating climate change are creating complex, interrelated challenges at both national and international levels.

Geopolitical Tensions and Trade Disruptions

The global political landscape has become increasingly volatile, with rising geopolitical conflicts disrupting established trade flows. The Russia-Ukraine war, for example, has significantly altered global food supply chains, as both nations are major exporters of wheat and corn. Blockages in Black Sea ports have led to global price spikes and heightened food insecurity (Zhu *et al.,* 2023). At the same time, prolonged U.S.-China trade frictions have introduced

volatility and uncertainty into bilateral agri-food trade, raising transaction costs and undermining predictability. These developments underscore the need for more adaptive and diversified trade strategies to buffer against geopolitical risks.

Competitiveness Gaps and Constrained Support

China lacks a comparative advantage in the production of most agri-food products, only a small subset of products demonstrates strong international competitiveness, while the competitive position of certain Chinese agri-food goods exhibits notable temporal characteristics. To assess the international competitiveness of China's agricultural products, this paper utilises the Revealed Comparative Advantage (RCA) index based on data from UNCTADstat covering the period from 2000 to 2023.

The competitiveness of different categories of agricultural products varies significantly. Most Chinese agri-food products exhibit an RCA index below 1, indicating a lack of comparative advantage. Figure 9 presents selected representative products. Among them, shellfish, vegetables, and fish show relatively strong international competitiveness, with RCA indices displaying a generally upward trend. Conversely, while some Chinese agricultural products had a comparative advantage around the year 2000, this edge has diminished over time due to rising land and labour costs. Notably, the RCA indices for cereals, nuts, and poultry declined significantly before 2008, with cereals ultimately losing their comparative advantage. Other products, such as dairy, animal fats, vegetable oils, alcoholic beverages, and cocoa, have consistently recorded low RCA values, reflecting China's persistent weakness in producing these goods.

Overall, the international competitiveness of China's agricultural products experienced moderate improvements around 2008 and again around 2013, periods that correspond to the global financial crisis and China's push for market-oriented agricultural reforms.

China's comparative advantage in agricultural production varies significantly across different levels of processing. Among processed categories, "Processing: Salt, Sugar, and Ingredients" exhibits relatively strong competitiveness, with the ingredients subcategory showing a particularly notable rise in its RCA index, from below 1 in 2000 to over 1.5 by 2023. In contrast, "Processing: Fermentation and Smoking" remains less competitive in the international market (Figure 10).

Notably, the international competitiveness of unprocessed primary agricultural products from China has been on a consistent decline. While these products held an RCA index above 1 prior to 2003, indicating a comparative advantage, that figure had fallen to 0.79 by 2023, suggesting a loss of competitiveness in global markets.

At the same time, China faces structural constraints in enhancing agricultural support. Rising input costs, especially for land, labour, and energy, are squeezing farm profits. Fiscal space for subsidies is limited, making it harder to sustain policy support at scale. Meanwhile, China's agricultural exports remain dominated by low-value, minimally processed goods, with limited progress in branding, quality certification, and value addition. Innovation and sustainable practices also lag behind global benchmarks, limiting China's ability to compete in premium markets or respond to rising consumer expectations for safe and eco-friendly products.

Under World Trade Organization (WTO) rules, the compliance of China's agricultural subsidy policies has garnered significant international attention. In recent years, the

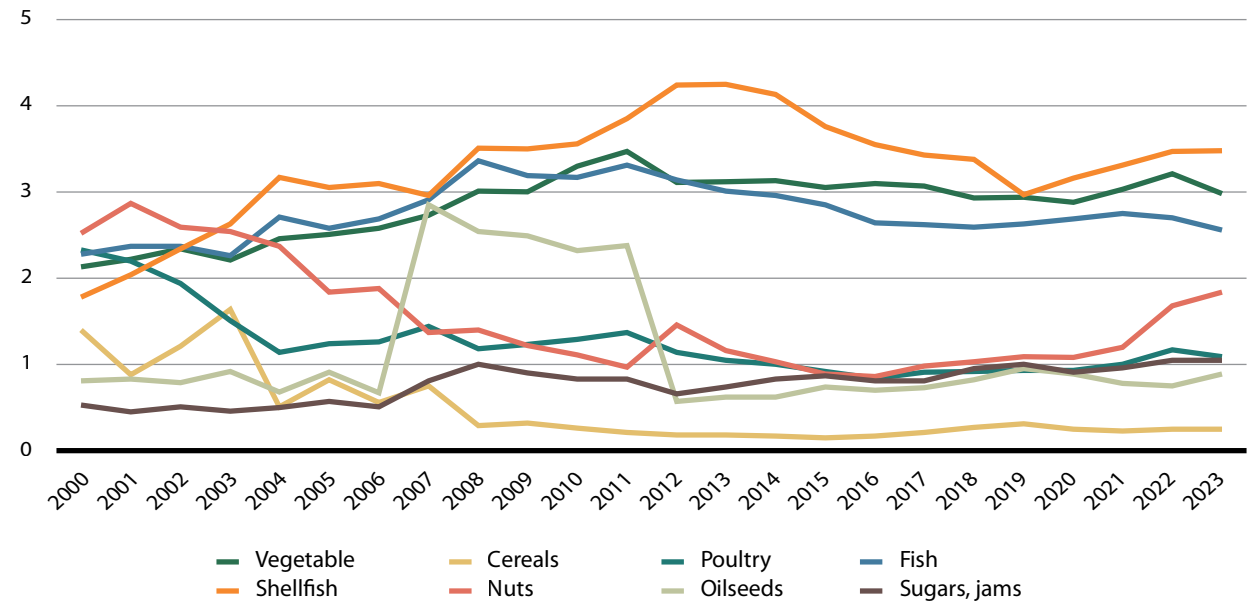

Figure 9: RCA index for different agri-food products.

Source: own composition based on UNCTADstat (2025) data

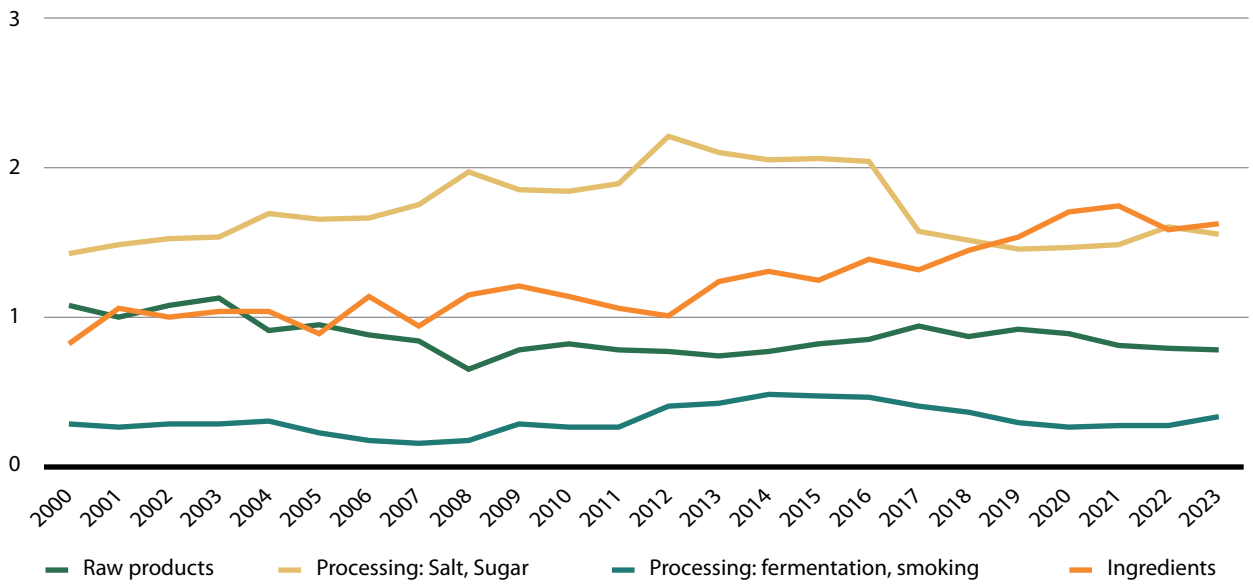

Figure 10: RCA index for agri-food products with different levels of processing.
Source: own composition based on UNCTADstat (2025) data

efficacy of China's agricultural subsidy framework has shown signs of diminishment, with certain policies demonstrating a notable divergence between their actual impacts and intended objectives. This misalignment has created a dual challenge: not only have these policies failed to achieve their designed outcomes, but they have also raised concerns regarding WTO consistency, risking a suboptimal equilibrium where policy goals and international regulatory requirements remain unmet (Xu *et al.,* 2020).

To address this, China must undertake strategic reforms to its agricultural subsidy regime, focusing on facilitating policy transformation and enhancing implementation efficiency. Such reforms should aim to align subsidies more precisely with the genuine needs of agricultural production while ensuring strict adherence to WTO obligations. By bridging the gap between policy design and operational effectiveness, China can strengthen the sustainability of its agricultural support systems while upholding its commitments within the global trading system.

Growing Import Dependence and External Vulnerability

Rapid economic growth and shifting consumer preferences have driven a surge in China's agricultural imports. While this has enhanced food availability and quality, it has also increased the country's reliance on international markets. Such dependence exposes China to various external risks, including export restrictions, climate shocks in supplier countries, and disruptions in global logistics. These vulnerabilities threaten domestic price stability and overall food security, underscoring the importance of reducing strategic exposure through greater self-sufficiency and diversification. This trend highlights the ongoing need for policy innovation to improve agricultural production methods and technologies and to enhance both the quantity and quality of domestic agricultural output.

Climate change poses a mounting threat to agricultural production and trade. Extreme weather events, such as floods, droughts, and heatwaves, are already disrupting crop cycles, reducing yields, and damaging infrastructure across China. Climate volatility also distorts trade patterns by limiting export availability in key producer countries and raising price volatility worldwide. China's own exports, particularly perishables like fruits and vegetables, face increased logistical challenges and spoilage risks. To address these risks, China must invest in climate-resilient agriculture, modernise cold-chain logistics, and implement adaptive policymaking for systemic resilience.

Policy Implications for China and Beyond

Over the past two decades, China has made remarkable strides in agri-food trade, increasing trade volumes, diversifying import sources, and expanding its influence in global markets. However, in an era marked by intensified globalisation and geopolitical uncertainty, China must navigate an increasingly complex landscape of risks and opportunities. To remain resilient and competitive, the following strategic priorities should be emphasised.

Strengthen Domestic Production and Agricultural Modernisation

Enhancing domestic production capacity is essential for bolstering food security and reducing vulnerability to external shocks. This requires sustained investment in high-value,

high-yield agricultural products, modernisation of supply chains, and upgrades to rural infrastructure. Technological innovation, particularly in precision agriculture, sustainable inputs, and cold-chain logistics, should serve as the foundation of modernisation efforts.

Promote Trade Diversification and Strategic Partnerships

Diversifying trade relationships is critical to mitigating geopolitical and supply chain risks. China should continue to deepen engagement with Belt and Road Initiative (BRI) partner countries, fully leverage regional frameworks such as the Regional Comprehensive Economic Partnership (RCEP) and pursue new bilateral free trade agreements. Strengthening South–South cooperation and expanding trade with emerging markets will be key to enhancing flexibility in sourcing and market access.

Balance Openness with Strategic Safeguards

While maintaining openness to trade remains crucial, it must be complemented by robust strategic safeguards. These include well-managed food reserves, targeted import controls for critical commodities, and comprehensive risk management frameworks. Such measures will help insulate domestic markets from external disruptions and enhance stability during periods of global volatility.

Invest in Sustainable and Climate-Resilient Agriculture

Sustainability should be at the core of China's future agricultural and trade strategies. Investments in climate-resilient farming practices, environmental stewardship, and circular economy models are essential. Policy measures that promote ecological agriculture, efficient water use, and low-carbon production systems will help align agri-food trade with long-term environmental objectives.

Strengthen Global Food Governance and Knowledge Sharing

China's evolving role in global agri-food markets offers valuable insights for enhancing international food governance. As a major agricultural importer, China should take a more active role in multilateral forums, support global efforts to stabilise agri-food markets, and share best practices with other developing nations. Promoting international cooperation on trade facilitation, food security, and climate adaptation will contribute to building a more inclusive and resilient global food system.

On the whole, this study presents robust evidence and actionable policy recommendations to support the continued evolution of China's agri-food trade strategy. Its insights also hold broader relevance for countries facing similar structural, environmental, and geopolitical challenges. Ultimately, China's ability to balance openness with resilience, foster innovation and sustainability, and lead in transforming the global food system will be pivotal in shaping a more secure and sustainable future for international agriculture.

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