



## CENTER for AMERICAN DEFENSE STUDIES (CADS)

*'America First – Not Alone'*

### CHINA THREAT - SECURITY BACKGROUNDER – 'Chinese Food Security'

*"China's 'Food Security' issue is critical to China's survival. It also has direct relevance to the Chinese Communist Party's (CCP's) regional and global strategy. While the majority of this piece is exclusively the analysis and views of Mr. Geoffrey Quartermaine Bastin, I have added my own conclusions and insights at the end. That commentary and analysis will be clearly distinct and are solely my own views and those of CADS." Paul Crespo, President.*

### 'Agriculture and Food Supply in China'

**By Geoffrey Quartermaine Bastin**

**China is the most successful farming nation on Earth. However, Beijing's aggressive drive for expansion overseas, its trade with neighboring countries, and activities within internal regions such as Xinjiang, is driven by concerns about a vulnerable food supply that are deeply ingrained in the history and political memory. "The people are the foundation of a country; food is the primary need of the people. As food decides national prosperity and the people's wellbeing, food security is a major prerequisite for national security.**

**China's food security issue is therefore a paramount concern to the CCP and its ambition to become the global superpower by the 100<sup>th</sup> anniversary of the founding of the People's Republic of China in 2049.**

#### Background

Since the founding of the People's Republic of China (PRC) in 1949, China has always prioritized food security in state governance. <sup>[1. China Daily]</sup> If China can be reined in it will be by pressure on its food supply. Food security is the priority for Beijing as it has been for every regime that holds the "Mandate of Heaven" (legitimacy) in the Middle Kingdom. Virtually all of China's actions can be considered through the lens of supplying 18.5% of the world's population. <sup>[2. Worldometers]</sup> with essential foodstuffs. This is a major motivator for both its domestic policies and foreign adventurism.

#### Demographics

The Chinese people have always formed an enormous group concentrated in a relatively small area of cultivable land. Food supply has determined the structure of society and its attitude towards others. When the Ancient Era (BCE) transitioned to what we call the Common Era (1 CE or AD) the Chinese population stood at an astonishing 60 million people or 26% of the world's population. <sup>[3. The Population Statistics of China]</sup> It still comprises the largest single unit of humanity.

All these people require food, water, and security, facts that whoever rules China, be it a 14<sup>th</sup> Century Ming Emperor or President Xi and his CCP, are acutely conscious of. That the area we know as China has provided the food to enable the continued growth and defense of such a large population speaks

volumes about the energy, organization, and sheer resilience of the Chinese people. It includes a long and successful history of cultivation and knowledge of farming systems <sup>[4. Shenglei Wu et. al.]</sup>

This needs to be explained clearly: agricultural productivity in Europe was not able to sustain large numbers of people easily. Western societies and political entities were less stable and less technically adept. For example, “four-crop” farming (involving rotation of turnips, barley, clover, and wheat crops) was not fully understood until the 18<sup>th</sup> century. <sup>[5. Author]</sup> Famine in Europe due to conflict and poor organization was common until the 20<sup>th</sup> century. <sup>[6. Author].</sup>

In North America, farming has hardly started by comparison with China’s history, Americans (outside of the calamity of the ‘Dust Bowl’ era of the 1920s and 1930s in the U.S. Southern Plains) have not known true famine, neither (in general) have they been confronted with severe limits on the amount of land and water available for agriculture. North America imported agricultural technology and then rapidly entered the modern age of industrialized farming.

However, China’s experience has been different, and this gives its rulers a quite different perspective on food security.

Despite its overall success feeding and growing its population, China has experienced agricultural failure from adverse climate and internecine war. The first major die-back occurred in the mid-19<sup>th</sup> century first with an uprising in the North (the Nian Rebellion) and soon after with the Taiping Rebellion in the south; together these wars against the Qing dynasty cost perhaps 30 million lives. <sup>[7. Corfield]</sup>

However, by far the worst catastrophe impacted directly on agriculture. This was the disastrous push for industrial growth known as the Great Leap Forward. This was an economic and social campaign pushed by Chairman Mao from 1958 to 1962. It included the incremental introduction of mandatory agricultural collectivization. Private farming was prohibited. Yields collapsed, while to save face the government continued to export grain. It is estimated that there were around 45 million excess deaths. <sup>[8. Frank Dikötter]</sup>

These events may seem old news to Western observers, but China’s history is ever-present in the minds of those in government. Food supply is the principal leverage the rest of the world, at least China’s competitors, have over Beijing.

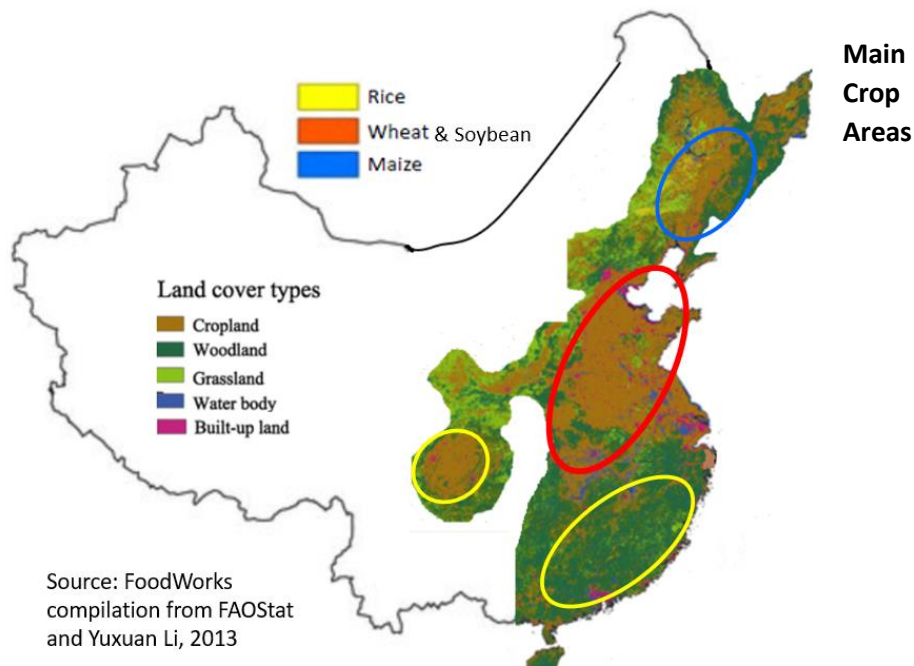
### **Present-day Agriculture**

China has a massive land area spanning from India to Mongolia, Korea, and the Mekong countries, and ASEAN. However, from an agricultural point of view, China is NOT a large country. From a farming perspective, it is one where a large population – 1.4 billion people – lives and depends on a relatively small area of cultivable arable land, roughly about 12% of the total national area. <sup>[9. Author]</sup>

Most of that is in the East and the center of the country between two of the world’s largest/longest rivers, the Yellow (Huan He) and the Yangtze with much of the land in the South-east given over to urban development and in the West to the desert (though that region offers a promise of expansion). The main agricultural regions are the mid-and lower Yangtze River region (Yangtze), the Northeast China Plain (NECP), and the North China Plain (NCP).

The Yangtze region, covering seven provinces with >200 thousand square kilometers, has always been China’s grain production center and accounts for over 70% of grain production. It has been squeezed by agrochemicals use and intensive farming. But with population pressure and a growing appetite for animal products, it has been estimated that China will need about 800 million tons of grain by 2030. <sup>[10. Yuxuan Li]</sup> There is little more room for increases in yields and certainly no more land available.

**Figure 1: China:  
Agricultural  
Production**



### **Current Food Production** [11. FAOStat]

China produces more food than any other country in the world. 20% of all cereals (rice 27%, wheat 18%) 24% of potato. It is the world's largest producer of bananas (10%), apples (45%), and tomato (44%). Growth rates since the impoverished times of the 1960s have been astonishing – rice output grew by 150 million tons or 281% between 1961 and 2018, wheat by over 800%.

The population has become better fed over time. Calorie consumption in China jumped from 1,495 to 3,194 Kcal/day/capita (1961 to 2017); not only did grain consumption increase but the diet swung towards a more protein-heavy cuisine that depended on livestock production (particularly pork and chicken, but also beef and dairy). China has huge herds of livestock; cattle meat production of about 7 million tons is 10% of world output and there is the world's largest concentration of pigs and poultry.

But China produces a relatively small amount of soybean needed for protein feed for these animals (4% of world production). Sugar is also just 6% of the total world supply. Fish and seafood also present a challenge for the regime to maintain a supply in waters China is supposed to exploit. This dependence on external sources for some foodstuffs gives a hint of the issues Beijing faces.

### **Principal Threat to Domestic Food Production**

It is important to distinguish between production, i.e., the output per unit of land turned into edible food items, and food supply, which is the total amount of food available given wastage, stocks, and imports fewer exports – the “food balance”. This paper deals with the former, the output of crops at the farm level.

*A study of China's agribusiness, merchandising, and processing capacity together with logistics and trade is not undertaken here. The analysis of these areas is essential for any comprehensive strategy that includes China's food supply.*

**China is not self-sufficient in food.** <sup>[12. FAOStat and ITC TradeMap]</sup> **It produces only about 60% of its total food requirement.** The 2018 Food Sustainability Index (FSI) was prepared by the Italian NGO Barilla Center for Food & Nutrition Foundation ranked China 23rd out of 67 countries in overall food sustainability. <sup>[13. Barilla]</sup> However, China was close to the bottom of the index at 57th for agricultural sustainability (i.e., domestic supply), shockingly just above Sudan (58th).

**Figure 2: China: Vulnerability to Food Imports**

Imported Products	Tons	USD '000	World %	Main origin
<b>Totals 2019</b>	<b>117,295,578</b>	<b>63,582,163</b>		
<b>Main Cereals</b>	<b>16,413,886</b>	<b>5,055,560</b>	<b>4.5</b>	
Rice	2,489,241	1,253,724	5.4	72% from Mekong
Wheat	3,204,806	901,034	2.2	30% Canada
Barley	5,928,780	1,561,312	24	30% Australia
Corn (maize)	4,791,059	1,061,586	2.3	95% Ukraine
<b>Soybeans</b>	<b>88,585,870</b>	<b>35,419,586</b>	<b>60</b>	65% Brazil
<b>Meat</b>	<b>2,827,132</b>	<b>6,818,476</b>	<b>14</b>	
Beef	37,852	296,567	1.3	95% ANZ
Pork	1,994,189	4,508,557	14	20% Spain
Poultry	795,091	2,013,352	8	66% Brazil
<b>Dairy</b>	<b>1,091,137</b>	<b>6,352,140</b>	<b>7</b>	
Milk	890,684	1,101,453	12	42% NZ
Butter	85,591	466,627	5	80% NZ
Cheese	114,862	522,009	2	55% NZ
<b>Oils and fats</b>	<b>8,377,553</b>	<b>9,936,401</b>	<b>11</b>	
Soybean oil	825,589	593,054	7	39% Argentina
Palm oil	7,551,964	4,108,380	14	70% Indonesia

Source: Extracted from UN ITC Trade map database for 2019

## Agricultural Development

Agricultural activity, as opposed to simple hunter-gathering probably began in China 10,000 years ago. This makes China the oldest of all cultures based on sedentary farming. Early in their history, before most other societies, the Chinese absorbed the connection between a strong industrial base, overseas trade and influence, and its food supply. Equally, technology-enabled a transition from the open field, rainfed agriculture with low productivity to more intensive, irrigated agriculture based on river water offtake, canals, and wells.

These irrigation systems required the training of specialists and the establishment of institutions that allowed water to be managed and infrastructure maintained and defended. Defense of the food supply was recognized as a priority. It comprised “farming defense systems” such as crop protection, rotation, and diversification.

Thanks to trade (for example with India and other Asian countries) new crops were introduced. Equally, a strong culture of rural militias and armed groups grew up to defend territory and infrastructure,

especially water resources, supply routes, and storage facilities. Military force was needed to control borders and neighboring kingdoms that supplied produce for which China's terroir was not suitable.

At a time when the West was struggling with "tribal" disputes, the Chinese developed a sophisticated bureaucracy and military outreach that enabled its economy to grow into the world's most powerful empire, the Middle Kingdom. Even so, the country has always remained vulnerable.

## Issues

### 1. Land

The main production area has been used for thousands of years and is only productive thanks to high levels of nutrient inputs. The land itself is not enough to ensure cropping. The soil itself must be capable of sustaining the crops, and most of China's terroir (the complete natural environment, including factors such as the soil, topography, and climate) is not suitable for arable (field) agriculture. Urbanization in Eastern China led to a loss of 7% from 1995 to 2000.

From 2001 China's total urban area increased from around 31,000 km<sup>2</sup> to 81,000 km<sup>2</sup> in 2013, an average annual growth rate of 13%. <sup>[14. Kaifeng Shi et. al.]</sup> This urban expansion consumed over 33,000 km<sup>2</sup> of agricultural land.

### 2. Water and Irrigation Infrastructure

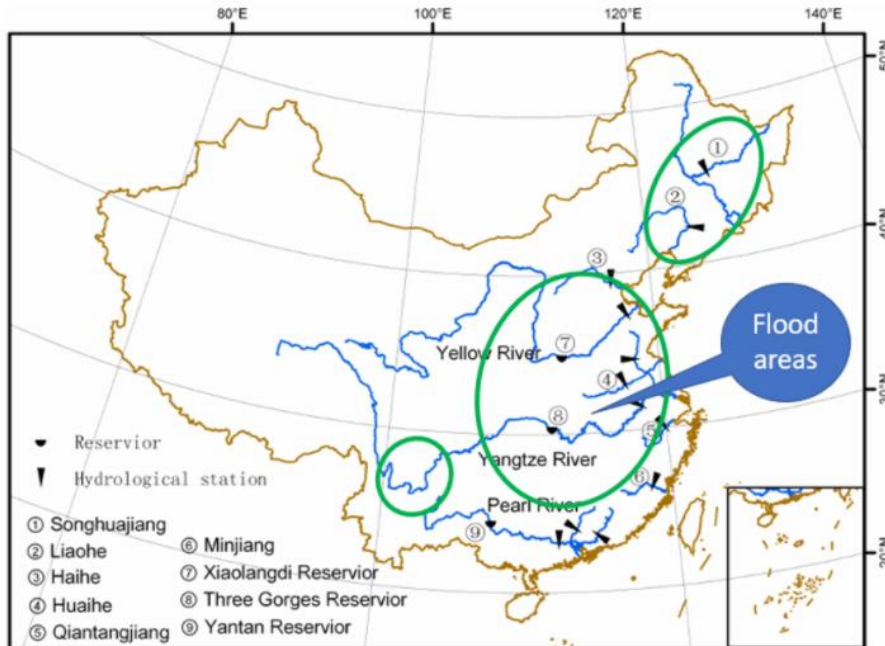
This traditional farmland depends on irrigation and drainage systems, many of which are ancient. The flat land between the two main rivers is subject to periodic flooding, but droughts are also experienced, particularly in the north. There is either too much water, or too little. China's water management systems are therefore critical, but they are complicated and expensive engineering.

They include dams and barrages, reservoirs, and an integrated set of primary delivery canals, secondary canals serving a section of the area "under command" and tertiary canals and ditches bringing the water to farmers' fields. Super-large-scale dams such as the Three Gorges Dam (TGD) hold millions of tons of water, cost billions to construct and maintain, and maybe at risk from disaster, construction faults, or direct attack.

*Today, there are significant concerns about flooding and even the integrity of the TGD. Its collapse would destroy most of the arable land on which the country depends and kill millions of people who could not be evacuated. The extent to which agriculture depends on river offtake cannot be over-emphasized.* <sup>[15.</sup>

*Author]*

**Figure 3: China: River Systems, Agriculture and Flood Risk**



Source: S.B. Dai, Hydrological Sciences, 2008

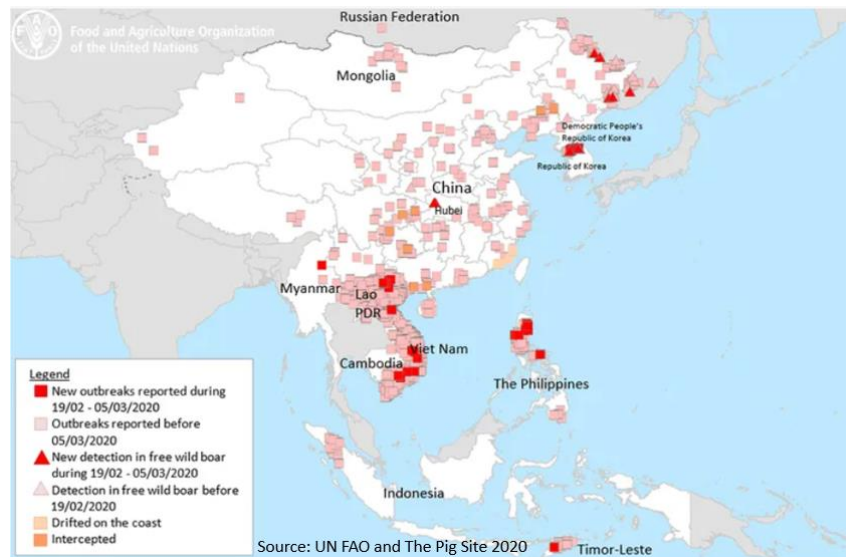
Groundwater (i.e., water remaining in static amounts underground and accessible by wells and pumps) does not offer a solution. More than 15% is “Grade V,” meaning it is so polluted that it is unsuitable for any use. This is a result of the heavy usage of nitrogen fertilizer and pesticides to raise yields. Moreover, groundwater has been contaminated with heavy metals from industrial manufacturing. These elements such as arsenic can be found in all domestically grown crops and are harmful to human health. [16. Kaifeng Shi et. al. op.cit.]

### 3. Disease

Chinese people enjoy meat, and they have become used to a rich diet that includes protein and dairy products from livestock. Pork is the preferred meat and China has held about half the world’s total population of 700 million hogs. It produces about 55 million tons of pork. [17. FAO Stat.op.cit] In 2018, this industry was hit by a severe outbreak of African Swine Fever (ASF), a viral (fortunately non-zoonotic) disease that kills the infected animal within days.

There is no treatment, and no vaccine for ASF, so the only way to contain the disease is to slaughter every hog on the farm. In the last eighteen months, China has lost approximately half its hog population, first swamping the pork market with product, then driving the price of pork up dramatically. [18. Melanie Epp]

**Figure 4: East Asia: Incidence of African Swine Fever**



The authorities are making strenuous efforts to remove smallholder farms where hygiene is poor, but the transition is disruptive and expensive. Hogs are not the only animals subject to disease and the dense concentration of livestock in small areas is a serious and on-going threat to human health. Previous outbreaks of human diseases such as SARS and Bird Flu are traced to origins in China, and of course, there is an open question about the origin of COVID-19.

### **China's options to mitigate food supply risk**

The potential failure of China's domestic agricultural production presents an existential threat to the CCP and the people of China. Even a partial reduction in a single crop output (e.g., as for hogs) will raise consumer prices, and Beijing (Mr. Xi himself) has already warned that more price rises may come. Widespread damage to the main crop area between the Yellow and the Yangtze Rivers, perhaps from a collapse of the TGD or even normal flooding, will destroy the lives and livelihoods of millions. These are real threats and issues being confronted now by the regime.

Disease among livestock requires massive effort. China's first biosafety level-4 lab (BSL-4) for large animals became operational in 2018 at the Harbin Veterinary Research Institute under the Chinese Academy of Agricultural Sciences. <sup>[19. HVRI]</sup> This laboratory is working on ASF, bovine foot, and mouth disease (FMD is a major and endemic disease of cattle). However, the entire livestock industry requires restructuring away from smallholder or family farms to enterprises that can be located safely outside urban areas and properly controlled.

Doing so is not at all easy since livestock husbandry is a major employer.

The water supply is an ongoing effort that consumes large amounts of finance and requires a huge bureaucracy. In some sense, it has formed the basis of Chinese civilization for thousands of years, giving rise to social institutions, laws, practices, and perhaps behavioral norms. China continues to add to the infrastructure outside the main growing areas, controversially building dams in provinces such as



Yunnan that use water flowing into other countries. It is difficult to see that Beijing will stop this approach since the third issue identified here is also intractable.

If water is made available, hitherto unproductive land can be brought into production. Given the loss of traditional land in the East, the only available alternative is South and West. There is land in Yunnan, but the main promise is in Xinjiang in the West. Although much of this huge area is desert, the north-west of Xinjiang is productive for fruits and livestock. However, arable agriculture for staple crops needs water, and Beijing has plans to bring in that water from Tibet.

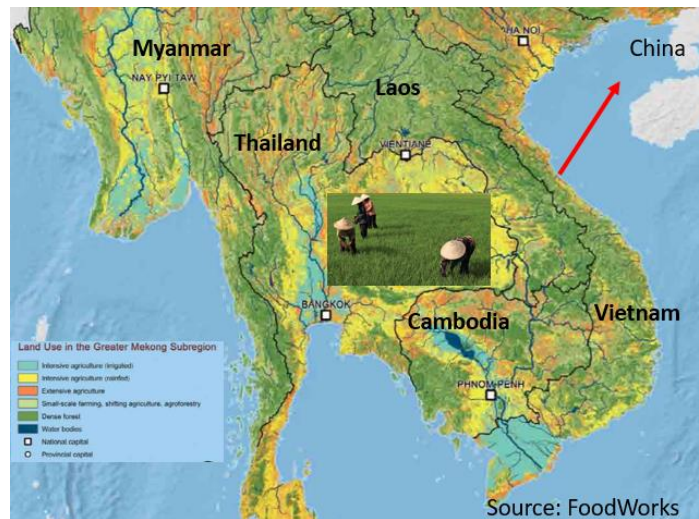
If those plans are followed, the diversion of water from the main rivers that flow from the Tibetan Plateau into India, Pakistan, Bangladesh, and Myanmar, will cause international conflict. Besides, the removal of millions of Uyghur people who are less productive farmers and prefer livestock rearing to be replaced by hard-working Han agriculturalist is already causing outrage in the international community.

**But Xinjiang is undoubtedly the only other place where land can be found.** [20. Abbasi, Naseer Ahmed et.al.]

Finally, China must look outside to produce its food requirements in other countries. The only other agricultural land China can rely on is South-east Asia. The Mekong countries export about 13 million tons of rice annually (Thailand and Vietnam are leaders and together already export 20% of their volume to China). [21. ITC TradeMap]

These countries also have fruits and vegetables in abundance. Thailand is one of the world's largest producers of high-quality pigs and poultry and even Laos offers excellent conditions for dairy production. China already has enormous investments in the region and must increase them.

**Figure 5: Countries of the Greater Mekong Sub-region – China's food reserve**



**This concludes the analysis by Mr. Quartermaine Bastin, CEO, FoodWorks Group of Companies, [www.foodworksholdinguk.com](http://www.foodworksholdinguk.com). All rights reserved in and forward from December 2020. The opinions expressed here are solely those of the author, not those of FoodWorks or its affiliates.**



*The following conclusions and insights are provided by Paul Crespo, President of the Center for American Defense Studies (CADS) and are solely the responsibility of CADS.*

### Options for U.S. and the West - Trade as Strategy

Given China's dependency on food imports to make up for its deficits, this is an area to which pressure can be applied. At its simplest, China could be embargoed with competitor countries restricting food exports. As one example, China has a high requirement for soybeans used in animal feed, especially for hogs. Although there are various suppliers, Brazil being the largest, the US is also a major supplier.

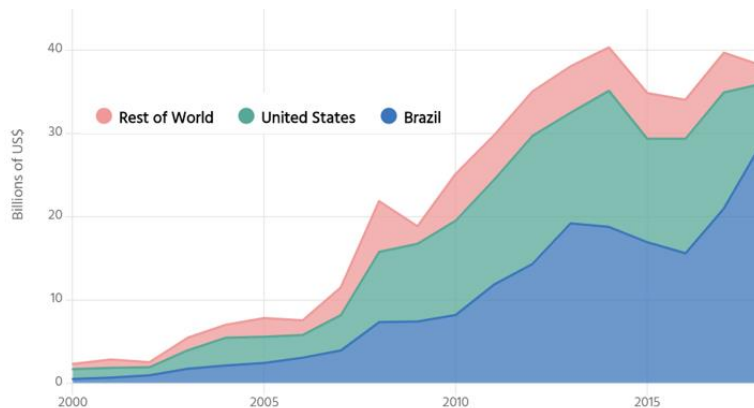
At certain times of the year, the United States is the only large supplier (i.e., when Brazil is sold out). A squeeze on soybeans would make life difficult for Beijing but would also hurt U.S. farmers.

That said, during the world food crisis of 2006-'08 it was found that:

*“poor households in China rely on basic cereals such as rice and wheat for the overwhelming bulk of their diet, and the country was effectively able to insulate itself against domestic grain price increases through a number of current and past public policy measures, including pursuing a policy of encouraging supply aimed at grain self-sufficiency, maintaining unusually large government stocks of grains and deploying them when necessary, and limiting exports through the imposition of quotas and taxes.” [22. Jensen and Miller]*

So, the question would be which side could squeeze, or be squeezed, the longest.

**Figure 6: Soybean Imports by China** [23. China Power]



Source: China Power from UN ComTrade

Damage to one's own country is a risk inherent in a trade war. As Australia has found, saber-rattling has led China itself to impose steep tariffs on wine and beef. Barley imports from Australia have also been limited. The risk is that China can replace these imports with products from other origins, e.g., wine from New Zealand (where we understand that vineyards are delighted at the problems faced by their cousins) or wheat grain from, say, Ukraine.

China's dependency on fish imports (a major element in the South China Sea (SCS) dispute) could also be used, but that would probably require direct naval action against the large Chinese fishing fleet which

roams not just the SCS but much farther afield. A squeeze on food supply from South-east Asia (the GMS countries shown in the illustration) is for now unlikely. China is heavily invested in these places with a particular emphasis on agriculture.

### Military Options – Lines of Communication (LOCs)

China may be vulnerable in its overall trade routes, although once again, direct action would reflect a serious escalation of the current low-level ‘Gray Zone Conflict’ between the US and China. The “Maritime Silk Road” describes the ancient (1000 to 600 BCE) sea routes to China. The Tang Dynasty depended on imports of spices and luxury products from India through the Straits of Malacca, commanded by Indonesian and Malay powers.

However, these Sea Lines of Communication (SLOCs) remain critical to China today. [24. Facts and Details]

There is no doubt that the closure of the Straits of Malacca would cut off about 70% of inbound traffic to China. [25. ITC Trade Map] Any conflict would, of course, cut off the trans-Pacific trade from the Americas and Oceania.

Figure 6: China: Main Trade Routes



If sea freight was compromised, there are overland options, though moving large bulk volumes might be difficult. The Alashankou Inland Port in Xinjiang links by rail to Almaty in Kazakhstan 880 Km west. Manzhouli Port in Inner Mongolia links through to the main Trans-Siberian spur which heads both west across the Eurasian steppes to Moscow, and east either terminating at Vladivostok or Beijing via Mongolia. As such, it is an important gateway to Russia.

Both inland ports are ‘Category A’ meaning they are financed by the State Council and have first-rate facilities. Conventional strikes against those targets would cause additional severe damage to China’s food security, not to mention military logistics.

*China's need for overland links through Central Asia helps explain the strategic imperative behind China's Belt and Road Initiative (BRI).*

**The most damaging option**, which would only be considered in the context of a full-scale kinetic conflict, would be to disrupt the main irrigation systems between the Yellow and the Yangtze rivers. A concentrated conventional attack on the Three Gorges Dam, for example, would bring the Chinese regime to its knees. But it would also make the Allied bombing of the Möhne, Edersee, and Sorpe dams in the Ruhr Valley during the Second World War pale by comparison.

***Hundreds of millions of people would lose their livelihoods and millions would lose their lives. This is not an option we wish to consider.***

That said, Beijing must be aware of its ultimate vulnerability in the event the strategic environment deteriorated to such an extent. The mere possibility of an escalation to such a devastating event could be enough to restrain the CCP from taking extreme actions, perhaps even in the case of invading Taiwan.

**CONCLUSION** - *China's Food Security must be considered integral to understanding China's geostrategic perspective. It must also be an integral part of any U.S. strategy to counter the growing Chinese threat.*

## References and Notes

1. 'Food Security in China', China Daily, 2019-10-15
2. Worldometers, <https://www.worldometers.info/world-population/china-population/>
3. 'The Demographics of Dynastic China: What Can 4,000-Year-Old Censuses Tell Us About Ancient China?', N.S. Gill, March 2019, in <https://www.thoughtco.com/demographics-of-ancient-china-117655> from an original source, 'The Population Statistics of China, A.D. 2-1953', Durand JD. Population Studies 13(3):209-256, 1960
4. 'The development of ancient Chinese agricultural and water technology from 8000 BC to 1911 AD', Shuanglei Wu, Yongping Wei, Brian Head, Yan Zhao & Scott Hanna. PALGRAVE COMMUNICATIONS | (2019) 5:77 | <https://doi.org/10.1057/s41599-019-0282-1> | [www.nature.com/palcomms](http://www.nature.com/palcomms)
5. 'Transformation in Agricultural Supply.', Geoffrey Quartermaine Bastin, 5<sup>th</sup> October 2017, <https://www.linkedin.com/pulse/agriculture-agribusiness-part-2-transformation-supply-geoff/>
6. Author's calculation based on various land use estimates and crop data from UN FAOStat - see Note 11.
7. 'Taiping Rebellion (1851–1864)', Justin Corfield, Wiley Online Library, April 2011
8. 'Mao's Great Famine: The History of China's Most Devastating Catastrophe, 1958–62'. Frank Dikötter, Walker & Company, 2010. "at least 45 million people died unnecessarily" p. xiii ("6 to 8 percent of the victims were tortured to death or summarily killed—amounting to at least 2.5 million people.") p. 333 ("a minimum of 45 million excess deaths").
9. Author's estimate - see Note 6.
10. 'An analysis of China's grain production: looking back and looking forward', Yuxuan Li et. al., (Center for Resources, Environment and Food Security, China Agricultural University), Food and Energy Security 2014
11. All agricultural production data are taken from the United Nations, Food and Agricultural Organization (FAO) Statistical Data Service, FAOStat. <http://www.fao.org/faostat/en/#home>

12. FAOStat op. cit. and UN International Trade Centre (ITC) TradeMap database. [www.intracen.org](http://www.intracen.org)
13. Barilla Center for Food & Nutrition Foundation (BCFN). <https://www.barillacfn.com>. 'Food Sustainability Index' was developed in collaboration between the BCFN Foundation and the Economist Intelligence Unit.
14. 'Urban Expansion and Agricultural Land Loss in China: A Multiscale Perspective', Kaifeng Shi (Key Laboratory of Geographic Information Science, Ministry of Education, East China Normal University, Shanghai) et. al., 'Sustainability', 2016.
15. 'China's Food Supplies in Danger', Geoffrey Quartermaine Bastin, July 2020, <https://www.linkedin.com/pulse/food-security-chinas-supplies-danger-geoff-quartermaine-bastin>
16. Kaifeng Shi et. al. op.cit.
17. FAOStat. op. cit.
18. 'ASF gap in China drives global protein inflation', Melanie Epp, The Pig Site, October 2020
19. <http://www.hvri.ac.cn/en/index.htm>
20. 'Water sustainability: the prospect of transfer projects in China', Abbasi, Naseer Ahmed; and Xu, Xiangzhou. School of Hydraulic Engineering at the Dalian University of Technology, 22nd EGU General Assembly, held online 4-8 May 2020, id.1766,
21. ITC Trade Map op.cit.
22. 'The impact of food price increases on caloric intake in China', Robert T. Jensen, Nolan H. Miller, Agric Econ. 2008 Dec 8; 39(1): 465–476.
23. China Power Project at the Center for Strategic and International Studies (CSIS), [www.chinapower.csis.org](http://www.chinapower.csis.org)
24. 'Maritime Silk Road', Facts and Details, <http://factsanddetails.com/china/cat2/sub90/item1102.html>
25. ITC Trade Map, op.cit.

---

## BIOGRAPHIES

*Geoffrey J. Quartermaine Bastin, Chief Executive of the FoodWorks Group is an Agribusiness Specialist, Economist, and Engineer with specific expertise on China and Asia. He also specializes in value chain development and market analysis, with over 35 years of professional work experience in Africa, Asia, and the Middle East. Geoff works with both the private sector and major International Financing Institutions (IFIs). He brings extensive expertise relating to economic growth, competitiveness, and multilateral trade in the agribusiness sector, and in-depth knowledge of related finance and investment mechanisms gained through senior management positions held with the world's largest diversified agribusiness (Cargill), IFIs, and private investment funds. In 1998 Geoff worked on a \$20 million Asian Development Bank loan for agribusiness in Hainan, China. In 2003-2004 he led a major food factory development project in Fujian for Procter & Gamble.*

*Mr. Quartermaine Bastin served in the British Army's Corps of Royal Engineers and was educated at the Royal School of Military Engineering as well as Oxford University. He currently resides in Bangkok, Thailand.*

**Paul Crespo**, President of the Center for American Defense Studies (CADS), is an American national security expert with over 30 years of experience in the US military, diplomacy, intelligence, and journalism. A former US Marine Corps officer, Paul served as a Naval and Defense Attaché with the Defense Intelligence Agency (DIA) at various US embassies worldwide. He also led projects at the US Special operations Command (SOCOM) and US Southern Command (SOUTHCOM) as a defense contractor. Paul has taught World Politics at the University of Miami and served on the Miami Herald Editorial Board. Mr. Crespo has degrees from Georgetown, London and Cambridge universities. He is President of the Center for American Defense Studies, a national security think tank, and CEO of SPECTRE Global Risk, LLC – an international geopolitical risk advisory. He is also the Managing Editor of American Defense News.

---

**END OF CADS SECURITY BACKGROUNDER - NO FURTHER PAGES**