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## From Memory to Present to an Uncertain Future: An Analysis of History and Policy on Chinese Food Security

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From Memory to Present to an Uncertain Future:  
An Analysis of History and Policy on Chinese Food Security

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Honors Project

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### **Abstract**

This paper seeks to analyze China's historical relationship to famine to better understand contemporary Chinese policy on food security. The historical analysis focuses both at the political level and the level of the peasantry, with a particular focus on the Great Chinese Famine. This Chinese specific analysis in conjunction with an understanding of food security history helps to better understand two white papers on food security from the Chinese Government in 1996 and 2019. This paper finds these white papers to be response to deep rooted doubts in the ability for the Chinese Government to logistically support such a massive population. These doubts are informed partly because of the remembered suffering of the Great Famine. The white paper's themselves respond to contemporary political issues and understand the future hardships agriculture will face. However, they lack a clearly defined plan in the event of a massive crop failure and what measures will be taken in such an event. Future research on China's food security must be done in Mandarin, particularly if there are any plans in the concluded shortcoming.

## Introduction

In the middle of the 20<sup>th</sup> century China faced one of the largest famines in the Great Leap Forward that still exists in living memory today. It was the culmination of thousands of years of famine throughout Chinese history felt by every generation. Following the Great Leap, the Chinese Government adopted policies to modernize their agricultural system and prioritize the ability to feed its large population. While examining the consequences of this new policy the paper will be comprised of two parts. First, it will recollect Chinese historical evidence on famine and the Great Leap Famine as well as other noteworthy events which have occurred in the global food system since then. Then, there will be a review of Chinese governmental policies on food security. By combining these two perspectives, this paper will attempt to analytically review the Chinese government's current stance on food security by observing memories, current hardships, and future uncertainties. This analysis will use sources such as government documents, and news sources to understand the view from the Chinese perspective.

When looking at the study of global food security, a wide variety of paths can be taken. To borrow an idea from Rischar, the complexity of this issue especially when combined with other complex issues creates the ability for it to become intractable (2002). There are many factors which can inhibit the yield of crops and even more debate on which cause is the most significant. Some experts stress water problems, many the rise in temperature, while others point to the decreasing amount of arable land. Even more contentious is the debate on issues with the global food system. One constant is that the combination of these factors leads to greater and more frequent crop failures. This in turn will make yearly food yields more unpredictable. The nature of this issue is therefore fundamental to human security. Every single person needs to eat to survive. More than just eating, people need proper nutrition to achieve optimal health

outcomes. Even six months of food insecurity for children under 24 months and pregnant women can cause developmental problems (Brinkman and Hyder, 2011, p. 268). Food and nutrition is part of the “water-energy-food security nexus” which forms a stable base for wider development (FAO, 2014). Firstly, it is important to turn towards Chinese specific history, which has been plagued by hunger.

## **Memories**

### **Pre-Republic Era**

The issue of food security is not only a fear of the future but also a fear of the past that is deeply rooted in the collective mind of Chinese culture. The fear of famine was not just within the recent history of the Great Leap Forward which plays an important part in this conversation; but stretches back to and before the time various actors recorded these agricultural and political matters. Mallory, a historian in the early 20<sup>th</sup> century found that between 108 BC and 1911 AD there were 1828 instances of famine in at least one province (qtd. Kane, 1988, pg. 26). Periodic lack of food was a constant in China, and it was not a phenomenon that could be overlooked by the various dynasties.

The process of climatic change events, which have led to the fall of many civilizations and nations were no stranger to China. The Ming Dynasty crumbled under the weight of drought in 1644. A series of droughts in 1627-1643 was a key cause of the peasant uprisings that would bring down the Dynasty. These droughts led to a 20-50% reduction in the per capita production of raw grain. This countrywide drought was also precipitated by the collapse of the military farm system which greatly increased government expenses on food (Zheng et al., 2015).

The emperors, particularly in the Qing Dynasty, sought to prevent and address famine to the greatest extent within their power. This is because famines were a sign that an emperor was losing the Mandate of Heaven. If a famine were to persist under the leadership of an emperor this would not bode well for the longevity of their dynasty. There was no way for the emperors to prevent drought from affecting crop yields. They could, however, attempt to alleviate the hardship of the peasantry and prevent unnecessary death from occurring (Kane, 1988, 29-30).

When famine broke out in Qing China, there are instances of the government both at the national and the provincial levels that attempted to alleviate the crises. In 1751, droughts affected the Zhejiang province of China while monsoon floods ruined crops in the northern sections of the country. The floods did not affect the crop yield as much as the drought, but the combination of these factors led to a crisis. The Qing Dynasty at the time took countermeasures to combat the famine, using official grain reserves. They transferred grains to Zhejiang and sold it at market to stabilize the grain prices. Finally, they exempted 83.3% of the provincial grain tax, allowing for more grain grown by the farmers to remain and combat hunger (Hao et al., 2021).

In the major famine of 1876-79, many of the same practices that had been applied previously in 1751 were applied here. This famine stands in contrast to the more regional famine of 1751, because the governmental efforts did not amount to enough, causing 9.5 million people to die. The communications and travel were so inefficient that the Qing ministers did not find out about the famine until months into the suffering. The poor infrastructure hampered relief efforts as many of the grain shipments from the Qing government failed to reach those in need. There were also many practical problems particularly with grain storages. Kane notes that here most of the aid was from philanthropy and wealthy Chinese lords and businessmen (1988, pg. 33).

An interesting note is made in the historical accounts about the various famines by Western observers. This is the notion that the Qing government and the Chinese in general did not seem to care that famine would continuously occur. Put more aptly by Bohr “the government was concerned only with relieving famine once it occurred rather than eliminating its causes altogether” (Bohr, 1972 p. 79). The tone of this analysis is concerning. Statements like these taken out of context, can be made applicable to the entire Chinese culture and civilization, especially at the time of their writing. The fact the private class intervened in the 1876-1879 famine shows that there was concern in Chinese culture. This analysis however is rather fitting of Mao and the Chinese Communist Party (CCP) less than 100 years later.

### **The Republican and Communist Period**

The phenomenon of famine in China is not something relegated to a distant past like it is in Europe. In Europe, the last natural famine was in Sweden and Finland from 1867-1869. Famines with human causes have occurred since then, most notably the post WWII famine in Germany. The German famine is now beginning to exist outside of living memory with its circumstance being relegated to a past milieu of events rather than those of the present. Famine was also not uncommon to communist regimes, as there were famines in soviet Ukraine in 1931 where Stalin did not care to alleviate the suffering. The Great Chinese Famine, however, is still within living memory in China. People of the older generation continue remember the times of famine and support policies against food waste. It is also discussed to some extent on Weibo, a Chinese blogging website, in the past 10 years. The memories of the Great Famine are also maintained within the succession of the CCP’s political class.

The way that various members of Chinese society remember the Great Famine varies as it comes to position and class. Officially, the CCP maintains that the Famine was a “leftist” mistake. One where unfamiliarity with the socialist system and weather played a factor. Therefore, it was a mistake of “good intentions.” Mao Zedong and the central government takes only a formal responsibility while direct responsibility was shifted to local cadres (Wemheuer, 2010, pg. 180). Other parts of society such as the peasants, cadres, and intellectuals remember the event differently. This can become a topic which is debated on Weibo but does not translate to an entry in a pluralistic historical encyclopedia like Wikipedia (Gustafsson, 2019). The lessons of such a massive event are not lost upon the modern CCP, however.

The Great Leap Forward was a series of initiatives which were meant to aggressively modernize the country. It was not a well detailed plan, which is normally expected of communist planned economies. The event occurred after the Sino-Soviet split and broke with the technocratic methods and guidance of the Soviet Union. Yet, at the same time, Mao had intended these policies to not only modernize the country, but to achieve the ideal communist state before the Soviet Union.

The new modernizations began with a series of water conservation projects which then progressed into other areas. Those initial attempts were not based upon clear guidelines, partially because they were deviating from the path of Russian specialists. The plans for these projects were therefore made by peasants and cadres in a slipshod manner. Mao gave these people free reign and creativity to achieve the Party’s desired increases in whatever field. At the same time the creativity had a one-time affect. In one example, after the Sputnik Commune had reported increases in grain production from deep seeding and close planting, the procedures for agricultural production were widely altered under the auspices of the cadres. The goal of this

plan was to ensure that the roots of the grain would be stronger and the stalks taller. Therefore, party leaders encouraged peasants to dig up to 30 centimeters and later to 60 centimeters deep. This practice however effectively disrupted soil nutrients and further ruined its quality (Dikötter, 2010, pg. 29).

A message which was amplified in the People's Republic of China during the early days of the Great Leap Forward was that the Chinese peasantry was in a "war against nature" (Baum, 2021, 4:25). The early water conservation projects meant that peasants left their homes, lived in barracks, and ate in military style canteens. They would march to the project site carrying their tools like weapons (3:40). This "war against nature" mentality, combined with the unbridled enthusiasm for modernization, would lead to the Chinese peasantry consuming the natural support from underneath them. Many ecologists fear global society is doing this today. The increasing wealth of China and India have led to more fear about the unintended consequences of future development.

One focus, which was a hallmark of other modernized and powerful countries was steel production. In 1958, Mao had promised that the People's Republic would outpace Great Britain in steel production within ten years. For perspective, in 1958 China produced 5.2 million tons of steel (Dikötter, 2010, pg. 14) while a year prior the U.K produced 21.7 million tons (Anonymous, 1959). This emphasis on steel stole the entire country's focus. Local party cadres and their communities would do everything in their power to increase production. The suggested policy was to construct small backyard furnaces. Mao praised the program for its ingenuity and therefore these furnaces popped up all over the country; even in places that did not have local ore to smelt.

When there was no ore, communities still ran these furnaces by stripping every piece of iron from the hands of the peasantry. This included woks, utensils, iron on the structure of houses, and most importantly farm equipment (pg. 59). These furnaces were also labor intensive. Their upkeep required peasants to constantly keep watch and fuel them both day and night. They similarly scoured the earth and felled many trees for fuel in the place of coal.

The way in which the Great Leap work programs had been constructed was so that the men would predominately work either the building projects or man the furnaces. This resulted in a shortage of labor allotted to farming in 1958. Reports show that the yield the year of 1958 was not particularly bad, but that the crop in many fields rotted away because there were not enough workers to pick and store the foodstuffs (Baum, 2021).

The leaders and the peasants were not worried about the harvest in the summer of 1958 and what it would mean for them. Many communes and leaders caught up in the excitement and inflated projections of food production most likely believed their unrealistic goals. Why stop eating when the whole country will be growing so much? Another common reason for this was because of the process of collectivization, which took on the militaristic aspects. Many of these communes all over China used the communal cafeterias to divide the menial labor of women and free more workers in the village for other tasks. Due to this, the peasants were eating without reservation during the first stage of the Great Leap. They simply thought this government provided food supply would continue indefinitely, particularly because they believed their work was integral to the success of the modernization of China.

The sad reality was that to Mao and many of the other high political leaders believed that the peasants were not integral. Their dedication to the Great Leap was praised, but in 1959 when

crop yields faltered, the peasantry received little to no government sustenance. Considering the circumstances, the tax rate remained extremely high. Mao even blamed the peasantry from hiding the grain and distributing it amongst themselves (Baum, 2021). The next year, the government increased the level of its grain request; the people could not subsist on what little was left.

During the seemingly tyrannical reigns of dynastic emperors, why did the peasants receive more sympathy and help from the government than the “people’s” government under Mao? The upper echelons of the Communist party at the time valued the labor of the people in the industrial heartlands of the country over the rural peasantry and the establishment of full communism within their regions. The grain which was exuberantly taxed from the communes was then diverted to the cities and growing industrial sectors. The party saw cities as truly key to industrial growth and modernization. Dikötter argues that both Deng and Mao were in favor of the high requisitions of grain and believed that the starvation of the peasantry was a necessary sacrifice in the pursuit of modernization (2010, pg. 134). This famine, which cannot be stressed this enough, was a manufactured phenomenon caused by a complete failure of the planning system.

There is also another international political aspect which should be noted when looking at the Great Leap forward and that is the political rivalry between the Soviet Union and China. More specifically, this was the personal rivalry between Nikita Khrushchev and Mao Zedong. The Sino-Soviet split was caused in large part by Khrushchev’s warning to the Chinese to avoid the cult of personality surrounding Mao. He attempted to warn them against the fate that the Soviet Union had suffered to Stalin. Baum brings up a crucial point that an admittance of failure especially in the later stages of the great Leap, where the consequences of the policy had become

painfully obvious, would have been an extreme loss of face for Mao (2021, 19:35). This cultural aspect is fundamental to Chinese society and is also a primary motive for the current Chinese party and its leaders.

Future famine (likely due to climate changes) will not be caused by the same factors as the Great Famine, but we should consider two key factors. The first is to fully grasp how the unnecessary human suffering that occurred during the Great Famine resulted in continuing hardship. One primary document outlines the horrendous effect of famine in just one town. It is a report by a Chinese investigative team of famine in Zhongqiu county in the Shandong province. The events in the following paragraphs come from this document.

There are multiple stories in this report of adults who had to bury their parents but did not have the strength to go to their grave or walk back home. They subsequently died the next day. (as cited in Zhou, 1968, pg. 7) Famine is not just a lack of nutrition that leads to emaciation and death, but also a story of desperation for any kind of nutrition, no matter the cost. Every available morsel of food and food alternatives were eaten. Leaves stems, sprouts, and planting seeds were taken and eaten. Desperate peasants stripped bark off of trees, some going as high as twenty feet. People would trade in their clothing to the communal cafeteria in order to buy food. (pg.5) They would take out loans from neighbors to buy food alternatives. Dikötter plainly states that “everything was for sale” and that some peasants even sold the roofs of their houses for food (2010, pg. 206).

The selling did not just stop at personal chattel. There were also many instances of selling children and women to others (1959 as cited in Zhou, 1968, pg. 9). In many instances the families did not know to whom or where they were selling the women and children to, making

them nearly untraceable after famine. There was a case of a woman who divorced her husband and remarried to a merchant with money because she knew no other way to combat hunger. The report said that the wife also regretted the divorce (pg. 10).

People became so desperate there were instances of cannibalism throughout the 1959-1960 part of the famine. Another primary document consists of multiple reports of cannibalism such as the one that follows, “Date: March 1960. Location: Kaixin village in Dahe. Culprit’s name: Fan Zhemaji. Number of victims: 1. Manner of crime: Ex-humed the victim’s corpse and consumed the flesh. Reason: To survive.” (as cited in Zhou, 1968, pg. 63) Each report in this study varies somewhat. Some instances involved family members, aborted fetuses, or freshly killed victims. Still, the reason which remained consistent across all the reports was “to survive.” Many of the corpses were exhumed. They were given the proper burial and respect in death, yet people were compelled to defile the dead because of their hunger.

When all these options vanished, people searched for a way to their end their suffering. A report tells of a woman who waited for her family to leave and work the fields, then made bread with her last amount of grain and rat poison. She ate half of the loaf and fed her child some. She subsequently died, but the child was saved. (as cited in Zhou, 1968, pg. 8) It is unknown how much unnecessary death was caused by the famine as some of the death counts across various geographical demarcations were counting total deaths and not famine deaths. In total, the famine caused somewhere between 15 – 55 million deaths. This is a rather wide margin, but the effect can be seen in population pyramids of China where the columns indicating people born during this period is smaller than the surrounding age brackets.

The Party has another fear: a possible future famine could lead to organized political dissent. Importantly dissent that would connect with the hardships of the people and make a mass movement in China possible. The CCP now focuses to solve the issues that have direct effects on local populaces. Chief among these problems are the adverse effects of global climate change as well as things such as water and air quality.

The amount of human suffering in the countryside was vast and not all the party disregarded that suffering. Peng Dehuai of the People's Liberation Army led the dissent to the Great Leap Forward. When he toured the country 1958, he could foresee the impending crisis of famine with the fruit of the fields being left to rot while the communes' focus was on steel production. In one story, upon seeing a peasant leave an ear of corn on the ground he told them that, "you can't eat steel" (Kane, 1988, pg. 48.). At the Lushan Party Conference that year, he wrote a letter which was critical of Mao's initiatives. The letter itself was critical by breaking the bubble of enthusiasm surrounding the Great Leap while also being respectful towards Mao, asking him to rethink how to carry out the policy going forward. Peng Dehuai did not speak out alone although he was designated to do so. Due to his criticism, he was ousted by Mao and put on trial. While Mao would eventually step down from his official position for the failures of the Great Leap this event effectively established his power to eliminate criticism. He would later use this power in the Cultural Revolution.

Visible and outward dissent within China in the contemporary CPP is exceedingly rare, particularly within the past ten years. There are factions within the party, but for the most part deliberation between them is opaque to outward observers. With the rise of Xi Jinping in 2013, he vowed to crack down on "tigers and flies" within the party in a large but unnamed initiative to crack down on corruption. Corruption remains a big issue within Chinese society and the party.

It has been largely speculated, however, that the crackdowns true aim was to pursue dissenters of Xi's political will within the party. This was done so that he could solidify his control over the CCP (Fiol-Mahon, 2018).

Today the CCP recognizes that the Great Leap was a leftist mistake but do not take blame for the devastating effect on individuals. It also in some ways recognizes the policy as a failure. While today's policies are not as horrendously costly as Mao's political directives were, in part due to a large wing of technocrats within the CCP, the past still serves a cautionary tale to modern leadership. Like any other dynasty, if crop yields fail and a modern-day famine occurs in China it will appear that the CCP has lost their mandate. A political dissenter with a popular and widely felt issue, like Peng, could arise amongst the ranks of the party and obtain public support. A situation like this could become even more acute for the CCP because of the prevalence of social media.

### **Food Security History**

There are two historical events which strongly effect the thinking and policy about the global food system. Each of these led to core realizations which policy makers now apply to potential future crises. First was the global food crisis and the subsequent Green Revolution. The second was the global food crisis of 2007-2008.

The food crisis and subsequent Green Revolution gets an abundance of coverage in many fields, therefore only a cursory glance will be taken here. In a brief review, the way in which food producers reliably increased food production was to utilize more land for farming. By the 1960s the world ran out of new arable land while population and food demand increased. Population theorists were precipitating a Malthusian collapse due to massive famine. Then a

simultaneous breakthrough of multiple technologies occurred. The most important were genetically modified foods and fertilizers which improved the yield per acre of land. From that point, food production met and surpassed the increasing demand. The Green Revolution also had a secondary effect of keeping global grain prices low due a greatly increased surplus of grains.

The Green Revolution was not without criticism. This new heavily industrialized agriculture is highly inefficient calorie per calorie because of the heavy uses of fertilizers to produce the results. Vandana Shiva criticizes the innovations because of its reckless use of water to grow food. She claims ecological farming can produce the same amount of food using ten times less water (Global Oneness Project, & Shiva, 2012). The Green Revolution, however, was a major victory for innovative technology, especially when it came to the food-water-security nexus. When facing these large global problems, it makes a general argument that technology will have the ability to innovate and meet future challenges. This idea is front and center when it comes to Chinese thought on agriculture. One example would be in a documentary from the China Global Television Network (CGTN), China's English language international channel called Megaprojects: Agriculture. One highlight from the program is the promotion of a strain of rice that can grow in water with a higher salinization content. A mass application of this technology would thereby increase the amount of land that rice could be grown on (CGTN, 2019).

The second and more recent historical event is the 2007-2008 Global Food Crisis. Countries before then had relied on the great surplus that the Green Revolution supplied to the world. Global food security during this time was reintroduced to both the media and the global public. During this time, it had become accepted that global population growth had slowed, especially in the affluent countries in Europe and the United States. While growth remains high

today in low-income countries, humanity is not following an exponential growth formula and similarly is not approaching an acute Malthusian crash. Simultaneously, sources from this time ask many questions on the ability to feed the countries of India and China who had both surpassed a billion people.

This food crisis, in contrast with the impending crisis before the Green Revolution, was not a factor of food scarcity. Rather, slight decreases in regional grain yields in Asia created a speculation crisis in food prices. Prices had been steadily increasing but in 2006 the prices of all major grains and edible oils rose rapidly and suddenly. The price of rice alone tripled to \$1,000 USD per ton in 2008. (Brinkman & Hyder, 2011, pg. 268) The sharp increase in food prices causes considerable problems especially for low-income daily wage earners. Many in developed countries are insulated from price increases because of food processing. While low-income earners spend a large portion of their income on food. They normally will not purchase a lot of non-staple food due to savings on the cost. Therefore, when staple grain prices increase, they will decrease the number of meals and therefore caloric intake to match the amount of grain they are able to purchase. Since 2 billion people rely on rice as a staple grain in their diet this made its precipitous rise that much more worrisome for the global community (pg. 269).

The actual causes of this rise are varied and multifaceted. Practitioners from various fields of food production and security had multiple ideas as to the causes and solutions of the 2007-2008 Food Crisis. An *Al Jazeera* Inside Story which took place at a UN summit in Rome to resolve the crisis shows just how differing and contentious these views can be. Sylvia Boren, who was a representative of a non-governmental organization (NGO) on the panel believed that the biggest problem was the subsidization of farming in developed countries whose cheap products gets “dumped” onto less developed countries. The argument followed that this

undermined farmers ability to grow their own food. Alexander Sarris, director of Food and Trade at the Food and Agriculture Organization (FAO) cited the increased demand for higher quality products and citing the supply stressors of the increased production of biofuels. Shiva, who was also part of the conversation blamed the increases in food prices as to the monopolized system of food production. Further she argued that the process of industrialized agriculture has increased the price of food production through technology and fertilizers. The clashing views in the conversation are exemplary of the views which exist in the broader field of food security and in between states at the international level (Al Jazeera English, 2008).

The confluence of events which included increased prices in fertilizers, the competitive prices between the oil and gas markets against the biofuel market, the speculation in the economy at large, and increased pressures due to the demand for higher quality products created a sharp rise in global prices. High level global political dialogue went a long way towards decreasing and stabilizing global food prices (Brinkman & Hyder, 2011). The prices however did not return to pre-crisis levels. Two important lessons were learned from this event. The first is the complexity of the global food system. This complexity was exemplified in the interactions between the energy and food market. These interactions created pressures and instability in the global food system. The second, was another dire reminder on the ramifications of hunger and food scarcity both natural and manufactured.

### **Present**

The present situation in China is one of anticipation. Increased pressures on the global food system, of which China is heavily dependent on food imports, and shifts in the global political sphere prompt these anticipations. The political and economic rise of their own country

has garnered the stark negative reaction of the U.S. This reaction cast into doubt the willingness of the U.S. to make up food imports willingly or affordably. Therefore, the Chinese government is testing multiple avenues to achieve greater food security. This paper will examine China's efforts in social engineering and practical political planning.

In 2020, the CCP under the express will of Xi Jinping implemented an initiative policy called the Clean Plate 2.0. This initiative calls for decreasing food waste and a stronger cultural consciousness against practices that encourage wastefulness. The original Clean Plate initiative was in 2013 and it aimed to crack down on food waste primarily in government, military, and party banquets. This new iteration of Clean Plate seeks to crack down on public food waste in all sectors of society. Some of the practices are common sense such as creating menu options with smaller portions and taking a social media picture with one's empty plate. Other practices approach a new level of social engineering such as restaurants placing limits upon the number of dishes a party can order based on its size, or restaurants weighing customers and providing meal recommendations based on their weight (Huang & Qin, 2020). This last practice was quickly discouraged, but it illustrates the policy to execution gap that exists and the creativity that the CCP allows the public to fill.

*Mukbang* or *chibao* in Chinese literally translates to food cast and involves content creators consuming copious amounts of food for online audiences. This content is not only popular in South Korea, its place of origin, but also China, Japan, and even the United States where creators develop multi-million view channels off the concept. In China, however, this trend disappeared within a few short days (Tidy, 2020). One of the few *Mukbang* producers left in China now creates this content without food. Why therefore is the Chinese government so obsessed with this social media trend? The answer lies in the unpredictable nature of food-

security for China in the future with 1.5 billion mouths to feed. As a result, the most interesting crackdown was on social media where *Mukbang* content producers on *douyin*, or Chinese Tiktok, were either censored or bullied away from that content.

The amount of people in China and India as well has raised concerns for many practitioners and academics. Many factors influence the unpredictability in the global food system of which this paper will illuminate on temperature most prominently. These factors also include poor land management, soil biology degradation, salinization, and alkalinization. General pollution from plastic sheets in the soil, poor waste management, and improper fertilization usage also play key roles. The ever-increasing list of problems and the continual growth of China into an urban and developed superpower weigh heavily upon the minds of the CCP. No issue or policy is too insignificant if it can prevent a future domestic catastrophe from happening.

### **1996 White Paper**

A mainstay of Chinese political life, and socialist/communist politics at large is the consistent planning of the economy. For the CCP, this means that a 5-year plan which is consistently made on that schedule. These plans are generally broad and cover a wide range of topics. Simultaneously, they serve as a cornerstone for both the Chinese political systems and outside observers to track the achievements and goals of the party and the state. Other times if necessary, the CCP will produce white papers outlining the policy and achievements on more specific issues. This section of the paper will now look at both types of documents as well as Chinese media outlets.

Since 1996, the Chinese government has strived for self-sufficiency in grain production. Largely, they have been able to achieve this goal, obtaining a one-to-one ratio of production and

consumption. Grain is a staple food and forms the base of the diet for most of the world. This was no exception for China before the 1990s. Yet the diet was rapidly expanding just as the economic system was. Vaclav Smil writing a few years before this white paper, noted China's diversified diet and the toll that this would take on China's environment (1993).

To understand the political plan of the CCP, it is important to return to the 1996 white paper entitled "The Grain Issue in China." the CCP outlined there the development of grain production. The paper began by mentioning its population of 1.2 billion people and then asked the question "Can the Chinese people feed themselves?" The CCP also directly addressed the issue later within the paper saying, "There is no basis to the international clamor about a "China threat in food supply. It is true that China imports some grain, but at the same time it also exports some foodstuffs with fairly high added value" (Information Office, 1996). This appears to be an insecurity not just from a physical nutrition standpoint but as an insecurity in their political thinking. The constant questioning of the carrying capacity of China and the Chinese government to logistically support such a growing mass of people became an internalized fear of the CCP. This insecurity was present far before the white paper's publication. One well known example is the highly controversial and criticized one-child policy. This can be viewed as China's attempt to project its self-sustainability to the global community.

Here one can find many of the foundations for food security policy which reappear in the 2019 white paper. This paper established the heavy focus on grain production which remains the focus today. Section V discussed the reliance on technology to increase grain. This included modified seeds, technological trainings, and many other unspecified technologies in grain production. The paper also mentioned the increasing diversification of the diet and in section VI sought to develop a sustainable husbandry system to better meet demands for proteins. Other

initiatives included development of unused water and land areas for aquaculture and internally increasing the supply of fruit. The precursor to the modern Clean Plate initiatives was the government guiding the consumption of food through a plan they called “Dietary Pattern Reform.” This plan focused on balancing the per capita grain used per person between consumption and livestock feed (Information Office, 1996).

### **How did the plan hold up?**

The primary objective of the 1996 white paper, which was to achieve grain self-sufficiency, has been achieved. China has been successfully able to increase its production of grain at a one-to-one production consumption ratio. Still, there were realities in the food security system that the report did not outline. Primary of which was rising temperatures, which threatens the consistency of all forms of grain production. The government may have known then about the impending issue, as they did talk about seed technology in the report, but this is the most important concern today. While raising the grain production is necessary, especially with the increased need for livestock feed, grain is now a decreasing part of the primary diet. From the perspective of food security, the Chinese government, while still focused on grains, (especially soy), is also concerned with issues of food diversity.

The Chinese also successfully developed their fishing and aquaculture industries. In 2018, China produced 81 million tons of aquatic food products. That is over \$20 Billion USD worth of fish that was exported (China Power Team, 2020). According to the FAO in 2017 the Chinese aquaculture industry is one of the most diverse and complex in the world with over 200 species farmed (FAO). Although there are many issues with the aquaculture programs such as quality control issues, and environmental degradation it remains as a strong comparative

advantage for China. This industry has become so robust that it has become part of the “Grocery Basket program” which helps to prevent shortages in non-staple foods (Baidu, 2021). Despite this, China is the third largest importer of fish according to the FAO. Roda International, a fishing industry firm, list that the biggest and most promising exports are with shrimp and cephalopods like squid (2020).

The strength of the fishing industry within China contrasted with its still high food and fish imports today reveal an underestimation in 1996 of just how much the diet would diversify. China proudly points out how many people it lifted out of poverty and its extremely strong growing middle class. Today, Chinese citizens are acquiring tastes for many new food products. This includes durians from Southeast Asia and a quickly growing appetite for avocados. The imports of avocados jumped from 2 tons in 2012 to 32.14 kilotons in 2017 (PRS, Newswire 2020). Another is largely through an increase in demand for meat products in the middle class. It is projected to go up by 119% to 1139.2 million tons (Sheng & Song, 2019). There is also increased demand for dairy products, in a place that traditionally does not use milk. These forms of food, while nutritious, are extremely land, food, and water intensive. While diversified diets pose various economic challenges, they assist in providing adequate quantities of nutrients that cannot be obtained solely by subsisting on grains and cereals.

One study predicts that total food demand in China is projected to increase by 33% by 2050. With the fastest increases before 2030, because of the highest increase in population and income growth (Sheng & Song, 2019). To meet this demand China has become a huge importer of food across multiple sectors. Particularly the need for beef, sheep and goat, sugar, dairy, maize, and soybean has increased. The China Power Project reported that the demand for soybeans exceeds the production capacity of Brazil and the rest of the world. Therefore, the U.S.

must fill the demand gap (2020). The ever-increasing demand for soybeans and other foodstuffs like durian can cause environmental damage to match it. In the case of durian, forests must be felled to make adequate plantations for growing (Mayberry, 2019). In Brazil, the demand for soybeans is part of the chain of Amazon rainforest deforestation, as it is sold to these farmers after the ranchers are done using the land (Brown, 2012, pg. 99-100).

Increased demands for other products will put strain on the existing grain needs other than meat. In 1993, Smil pointed out that China did not have enough excess grain to meet its demand for alcohol (pg. 82-83). In 1996, in the CCP's white paper on grain sufficiency the response to this problem was to change the diet and curb alcohol consumption (Information Office, 1996). This specific policy has not succeeded. By 2030, China's alcohol consumption will be for an average adult 10 liters of pure alcohol per year compared to the global average of 7.6 liters. This projected increase will put more strains on decreasing grain outcomes and increase alcohol related health problems (Guardian News, 2019).

Another factor towards increased demand and consumption is the continued urbanization of China. Now, over 50% of the population of China lives in cities. Firstly, animal products are consumed at a rate of 2 times higher in urban areas as opposed to rural (Gandhi & Zhou, 2014). With large migrations for work, people are now buying food as opposed to growing their own. This increases the income elasticity to buy higher income products like meat, poultry, and dairy (Zheng et. al, 2019). This urban challenge of managing the supply chain also has many implications for food safety which impacts the cost of food and food security for the country. These issues in concert, demonstrate the complexity of the global food system. Every policy and non-staple food demand affect the staple food supply.

Today many lesser developed countries (LDCs) face the challenge of industrializing. In various ways developed countries attempt guide or control their development to avoid many of the mistakes of industrialization; prime among them is environmental degradation. The LDCs in turn do not see the developed nations actions as help but rather a limitation on their own growth. China is not an LDC, but this situation which occurs across the developing world also has parallels here. It is possible for observers in food security to vilify China's economic rise through this issue. However, it would be hypocritical both practically and morally for developed nations to limit Chinese diversification of their diet. Globally, while there are individual health benefits for eating less meat, a sustainable and nutritional diet for the world population must be plant based, but also requires a sustainable source of animal products (NZX Limited, 2020, 13:10). Economically speaking, many developed nations like the U.S., Australia, and Russia are benefiting from food exports to China. Morally speaking, global food security will not be resolved only if China and India were to curb their increasing demand. These countries are only adopting the same practices that the wealthier nations project.

### **October 2019 White Paper**

Now that China's food security progress has been established, attention will now be given to the most recent government white paper on food security. This paper was released in October of 2019 and was simply titled "Food Security in China." In context, this document was produced before the Clean Plate initiative 2.0. Therefore, it did not intensify China's social and cultural norms on the issue of food waste rather it outlined the government plan on food security for the foreseeable future.

The impetus for this white paper was the growing uncertainty in relation to food trade, particularly with the U.S. and other great food traders such as Australia and Canada. According to the International Trade Administration Food exports from the United States to China fell from 15.8 billion USD in 2017, to 5.9 billion in 2018 (Chinn & Plumley, 2020). The USDA has a different count on the amount of trade which occurred but demonstrates the similar story, which is that during the tensest parts of the China – U.S. Trade War agricultural exports fell significantly. Such a sudden drop in food exports created doubt in the ability of the Chinese government to meet the increasing food demands of the country. This is particularly acute in the possible scenario of a prolonged trade-war in which agricultural exports would remain depressed. Therefore, the global and internal question led to a need to reiterate and commit to a self-sufficient food security.

The white paper is divided into four parts. The first is “China’s achievements in Ensuring Food Security” recalling its successes in being nearly grain sufficient since the last white paper. The second is “Food Security in China” which outlines the next set of objectives which heavily focus upon grains. The third is “Opening Up and International Cooperation” where China portrays itself in a central international role working diligently to alleviate the rest of the world’s food security issues. The last is “Prospects and Policies” outlining the future improvements that need to be done, key among them is enhanced productivity but also building a resilient and globally minded food system.

The first section focuses upon the achievements of China since “The Grain Issue in China” in 1996. The first highlight is the increased output of food per hectare necessitated by a lack of arable land. The paper puts up impressive numbers. Since 1996, the Chinese have had an 11.3% increase per hectare of rice, 46.8% in wheat, and 17.4% for corn. It then boasts for rice

and wheat that they are around 50% higher than the world average (The State Council, 2019). While at first sight it is impressive this last percentage can be somewhat misleading as China in 1996 was already a large producer of rice and wheat.

The CCP says that it has “absolute security of staple grains” (The State Council, 2019) except in one major grain, which is soybeans. They openly acknowledge their need to import soybeans, but they immediately follow up reiterating that rice and wheat combined only amounted to 7% of total food imports. In the early 20<sup>th</sup> century, China was the highest producer of soybeans until the United States overtook them during the WWII period. The shift was brought upon by a policy initiative to search for high-protein food stuffs (Pullman & Wu, 2014, pg. 74-75). The use of soybeans does not only go into direct soy products like tofu, tempeh, and soymilk but it is also a critical component of animal feed. It is important that feed contain soy because it boosts the efficiency of livestock and poultry to convert the grain into protein (Brown, 2012, pg. 92).

The shift away from soybeans to other grains like wheat, rice, and corn was an intentional policy choice made by the CCP. There is continuity being signaled here in their growing policies. The CCP then and now appears to value growing rice and wheat as more important to food security. Now, there would not be a way for the Chinese government to shift from the other grains to soy without the need to import those grains in high quantities. A few sentences after the importation statistic on soybeans, the CCP claims that the main driver for food imports is to “satisfy the need for variety” (The State Council, 2019). At the basis this is true but this staple crop’s multifaceted use and its ties to the U.S.-China trade war make it a potential security concern in coming decades.

The next section entitled “Food Security in China” brings the focus onto future goals. It focuses heavily on the grain sector and attempting to increase both the amount per hectare of grain produced and the number of grain farmers. This section first focuses on an initiative for establishing a “red line for the protection of cultivated land” which includes 120 million hectares (The State Council, 2019). This “line” was drawn in 2007, in response to falling rates of arable land due to development (Blanchard, 2007). CGTN says that the country still resides well above the red line (Zhang, 2019). While the red line policy is functional and addresses issues like development on arable land it cannot prevent yields from failing.

Following this point, the focus is on insuring the grain supply of China through various other policies. These include setting aside 60 million hectares for grains in a “functional area” and 15 million hectares for a “protected area,” for “important agricultural products like soybeans and rapeseed.” They have also abolished various taxes as it comes to food production (The State Council, 2019). Their most effective tax abolishment was the “agricultural tax” where a specified percentage of outcome was given to the government or purchased at a lower governmental rate (Lin & Liu, 2007). This policy change was meant to guarantee farmers income in a rapidly urbanizing China with a smaller farming class. Studies into the effectiveness of this policy find an insignificant effect on household income (Wang & Shen, 2014). There were also policies stated to better the grain markets and modernize farming practices.

Section three focuses on China’s relation to food security internationally. The beginning of this section expands on the growing food industry in China that gets exported to other countries. China maintains that they are committed to fair trade and are WTO compliant when it comes to their food industry. Interestingly this section, aside from the unavoidable importation of soybeans, China does not illuminate any other policies on its importation of foods and securing

of food markets in other countries. The record reflects, however, that China is a massive food importer not only for the grain of soybeans but for acquired tastes in fruits, aquatic products, and vegetables. This conscious omission in the white paper is not because of a lack of policy. One of the facets of the China's international development endeavors is to attempt and secure food markets to keep pace with increasing demand.

Another characteristic of this section is portraying itself as a multilateral leader in the area of food security and developmental cooperation. The CCP portrays China as a leader in the forum of food security; and in subsequent articles by Chinese news sources, they illuminate the critical Chinese role played in increasing grain outputs in Kazakhstan (CGTN, 2017). This image tends to affirm China's projection as the south-south cooperater especially along the lines of the Belt and Road Initiative (BRI). There is credence to this, as China's willingness to cooperate and fund various projects, along with their technological innovations, make them a sought-after partner. The actual geopolitical power they have held over the past two decades, and the countries use of that power against other countries speak to the contrary and have passed to the club of developed countries.

In conclusion, this white paper appears to be a response to the international question of whether China can feed itself in the face of heavy tariffs on agricultural exports from the U.S. Its grain-centric focus, while correct, obscures other fears about food security by the Chinese government. There is a recognition that China does import food but is no way beholden to exporting countries. This contrasts with other views and reports which iterate the need for other countries and their food production. In this paper this facet of food security is severely underplayed. It could be argued that this document is focused on only internal policies, however it does not stay within the national realm.

### **Towards an Uncertain Future**

There are global issues developing now that encourage China and all states to develop plans for. Stepping outside of the Chinese political and historical lens for a moment, it is prudent to examine the global factors that will affect food security. Due to the complexity of the issue, it quickly becomes intractable like many others. The food system is not just inputs and outputs, but also affected by social, cultural, and political factors as well. Outside of the Chinese context and control, food security gets further complicated with climatic changes which affect rainfall, and temperature. This has quite a significant impact on the growth and germination of rice an important staple food for the Chinese. A study found that a rise in temperature will negatively affect the growth of many staple foods like rice, maize, sorghum.

The COVID-19 pandemic has only further accelerated a global food security crisis. At the beginning of the global pandemic, there were 135 million people in the world facing acute hunger. One year later in 2021, 270 million people face acute hunger (Sova, 2021). This trend is currently not due to a lack in grain production or trading as production hit a record high in the last year. Rather, the issue and particularly with China lies on the new nature of this food crisis. The crisis now impacts poor daily wage-earning urbanities. This is especially true in the tourism sector which has primarily remained shut down amongst other openings across the world. The complex foods that are demanded by urbanites, particularly ones that require stable food chains, are also susceptible to shock by the pandemic (Sova, 2021).

The global food crises and the COVID-19 pandemic illustrate an important fact that cannot be lost on the CCP. A potential future food crisis will not be a standalone event, but rather be accompanied with other global crises. The compounding factor of crises, like that which many countries are buckling under during this time, will make solving an *in medias res* famine nearly

impossible. This compounding factor further endangers the regime-security of all ruling parties and institutions of states.

The most prominent food security threat however is the expected decreases in agricultural productivity due to climate change. The projection on how an increase in temperature will affect the production of food is a very bleak prospect. To illustrate the effect of how temperature on crops correlate the to the representative concentration pathways (RCPs) was released by the Intergovernmental Panel on Climate Change (IPCC) with their temperature increases and what that will do to the plants (2014). Firstly, in the best possible scenario which is RCP 2.6. In this scenario governments will fully commit to policies that do not raise the global temperatures by 2°C. Here, it is likely that temperature will raise by 1.5°C but “unlikely” to reach 2.0 C. RCP 4.0 and 6.5 represent middle of the road scenarios where developed nations are able to access low carbon technology while developing nations fall behind. In RCP 4.0 the global temperature rise is expected “more likely than not” to reach 2°C and RCP 6.5 is “likely” to reach and exceed 2°C (IPCC, 2014, pg. 10). The IPCC also maps a high emission no mitigation scenario which is unlikely because states are committing to some emissions promises.

There are many reports mapping the effects of temperature on crop yield using modelling. Each report varies somewhat but the scientific consensus is that increased temperature will have a negative effect on crop growth. A general finding stated that with every degree in atmospheric temperature rise there is about a 5.6% loss in crop yields for RCP 2.6, and a 18.2% loss in crop yields for RCP 8.5 which is the highest scenario. For rice, this effect is less severe according to the study with 1°C temperature will reduce global rice yields by  $3.2 \pm 3.7\%$ . This yield loss gets more severe in India (Zhao et. al, 2017).

It should be noted that this is temperature only. It does not only affect the germination process of crops, but also makes various other events more common and more severe. One is pests, which increase in intensity in warmer weather. Over the past two years the world witnessed one of its biggest and most devastating locust swarms in East Africa, the Middle East, and the Indian subcontinent. The FAO reported in February that the Western regions of Africa and the Eastern Region of Iran and Pakistan are now calm (FAO, 2021). Yet, the central region of East Africa is dealing with subsequent generations of the locusts which are still a threat in the region. There is no concrete estimate as to how much these locusts have eaten but this crisis has undoubtedly affected millions in already malnourished areas.

Just an illumination of these future factors and recent events shows a key insight which all governments are grappling with; that crop yields will decrease and that larger yield decreases are more likely with prolonged extreme events of heat and cold. This uncertainty naturally creates more insecurity. Many countries bracing for a moment where the global system does not produce enough food to nourish all people.

In Brown's book "Full Planet, Empty Plates" he develops an argument where rapidly decreasing water tables, soil degradation, and rising temperatures all create a severely bleak picture for humanity at large. In the case of a crisis he simply states, "Spreading food unrest will likely lead to political instability. We could see a break-down of political systems. Some Governments may fall" (2012, pg.114). He proposes many solutions. Most of which are responded to in the UN's Sustainable Development Goals (SDGs). The crisis will be complex, and Brown believes that it involves "ministries of energy, water resources, transportation, and health and family planning" (pg. 115) to reach the solution in which the global community will realistically be able to cope with the various looming situations on the horizon. However, the

effects of various aforementioned factors can already be seen in regions such as the Middle East and North Africa (MENA) and Central Asia where both the manufactured and natural inhibitors to farming bring into serious consideration the ability for these places to continue producing food. For the MENA region even with the various irrigation and water divergence schemes grain production has decreased significantly (pg. 62). In Central Asia, the soviet irrigation policies which have created the disaster of the draining the Aral, leads to severely diminished water and salinized dustbowls making fields inarable (CaspianReport, 2019).

These issues for China may not be as distant as the CCP would hope. Simultaneously they are not oblivious to coming challenges of the next decade with a direct address in the 2019 white paper saying, “China will find itself under considerable pressure to maintain steady grain production while ensuring green development and sustainable resource use.” The bold plans for carbon neutrality by 2030, and zero carbon by 2060, are the CCP’s attempt to mitigate the severe consequences of climate change. The CCP will never let these initiatives place them at global political disadvantage, but simultaneously ignoring the problem is just as much of a real security threat as it is a regime security issue.

The shortcoming of the Chinese vision for national food security is the hypothetical scenario where a massive crop failure occurs, and China must rely on food imports. In the section “Prospects and Policies” the CCP mentions their intention to increase cooperation with other countries, particularly those involved with their massive infrastructure project: the BRI. The subheading title in this section however is “Safeguarding global food security” and it can be assumed both by the focus on the BRI, South-South cooperation, and Chinese grain enterprises that China will be doing the safeguarding (The State Council, 2019). It is already acknowledged in other news sources and documentaries that certain agricultural spaces in China are working on

the extreme edge of success and failure particularly with water (CGTN, 2019, 16:12).

Technology, a hard-working spirit, and ingenuity can take humans extremely far, but overreliance on such factors like that in the Great Leap Forward creates deadly consequences when things fail. The Chinese government today is more meticulous and technocratic in their planning and would not let their people suffer to such an extent again, but an observer must still have doubt in global food sustainability.

### **Conclusion**

This paper has synthesized the Chinese perspective on food and famine. The long history and experience with famine combined with the historically recent and devastating Great Leap Famine leave an indelible mark on the Chinese cultural outlook of food. These internal memories combined with international doubts of the carry capacity of China translate into deep rooted internal doubts about the ability to support 1.3 billion people. In the present, China is taking stronger social actions to try and reduce food waste, greater than many other countries. When the Chinese government sets its mind to a task it can achieve impressive results. This has been proven in its successes with grain security. At the same time, both white papers appear to be ambitiously vague at certain points, or they are promoting policies that do not have a significant positive effect. Future research will need to occur into Mandarin documents and news sources on this topic. It will also need to examine how the CCP are approaching cooperation and how they plan to approach other countries if the national food security programs were to ever fail. Finally, while China champions its form of multilateralism in opposition to “protectionism and unilateralism...” (The State Council, 2019) this multilateralism in food security must be examined to determine if it is working towards the benefit of all partners in the relationship.

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