

# Food Security and Institutions: The Case of China<sup>1</sup>

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## Abstract:

Since the early 1980s, China has remarkably improved its food availability. While the comfortable food availability is highly commendable, China has not been able to achieve a high level of food security. In this paper, it is argued that institutions have hindered China to achieve a higher level of food security. Innovative reforms are needed to improve the current institutional arrangements. Most importantly, changes are needed to ensure the establishment of a governmental institution that will ensure that government operations are efficient, government policy processes are transparent, and government official are held accountable to the people under their jurisdiction. Only with substantial reforms to the current institutional arrangements can China significantly improve its food security in the future.

**Key words:** Food security, institutions, governmental institution, China

**JEL codes:** D73, O13 and Q18

## 1. Introduction

In this paper, it is argued that a country's food security is fundamentally influenced by that country's institutions, especially, its governmental institutions, using China as a case. The People's Republic of China was established on 1 October 1949 by the Communist Party of China (CPC). Since then, China's food security has experienced two vastly distinct periods. Prior to the 1980s, food availability was poor and citizens were far and wide undernourished. Since the 1980s, food has been plenty and extreme case of starvation is rare (Zhou 2010 and 2015). While food availability has been significantly improved, which is central to food security, other important aspects of the country's food security remain little improved or even become deteriorated.

The lack of improvements in other important aspects of China's food security is due to limitations in its institutions. "Institutions are systems of established and embedded social rules that structure social interactions" (Hodgson 2006). Five primary institutions are found among all human groups: (1) in determining Kinship; (2) in providing for the legitimate use of power; (3) in regulating the distribution of goods and services; (4) in transmitting knowledge from one generation to the next; and (5) in regulating our relation to the supernatural. These five basic institutions can be called family institution, political (or governmental) institution, economic institution, educational institution, and religious institution.

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While all these five primary institutions may affect food security of a country in one way or the other, two of them, governmental institution and economic institution, would have the most determining influence over a country's food security. Extending from the general definition of institutions by Hodgson (2006), an economic institution is the set of rules and norms that govern the production and distribution of goods and services in any particular society. Examples include laws governing property rights and commercial transactions, court system, and policy organisations like legislatures and regulatory agencies. A governmental or political institution is the set of rules and norms within which governments operate, including such concepts as the right to vote, responsible government, and accountability. Governments create, enforce, and apply laws; mediate conflicts; make policy on the economy and social systems. As such, economic institutions of a country are also primarily influenced by its governmental institutions. In this paper, the discussion will involve both economic institutions and governmental institutions, with a focus on how the lack of food security improvements is related to the limitations of the governmental institutions.

In the next section, a normative food security framework is presented; against which the current status of China's food security is evaluated in Section 3. In Section 4, issues concerning China's food security are highlighted. How such issues are affected by institutions is further elaborated in Section 5. Conclusions and implications are given in the last section.

## **2. Food Security and Its Evaluation**

Food security, as a concept, was adopted at the 1974 World Food Conference held in Rome by the United Nations under the auspices of the UN Food and Agriculture Organization (FAO). In the 'Universal Declaration on the Eradication of Hunger and Malnutrition', governments attending the World Food Conference proclaimed that "every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop their physical and mental faculties" (World Food Conference 1974).

Since the 1974 World Food Conference, food security has increasingly been in the focus of food policy discussions. In the earlier days, food security was broadly defined as access by all people to enough food to live a healthy and productive life (FAO/WHO 1992, p. 2). Over time, increased efforts were devoted to food security study and different versions of food security were proposed. At the 1996 World Food Summit in Rome, leaders of 186 participating countries agreed that

*"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (World Food Summit 1996).*

This definition has been widely adopted; many writings used this definition in addressing food security issues on various occasions. In 2009, world leaders again convened at FAO Headquarters for the World Summit on Food Security, pledging their renewed commitment to eradicate hunger. At this convention, the definition of food security used is almost identical to the one adopted at the 1996 World Food Summit with only two minor wording differences (World Summit on Food Security 2009, p. 1).

The 1996 definition adequately reflects the distinctive features of food (Spitz 1985). It also adequately embraces and highlights several important aspects or dimensions of food security as follows:

- **Food availability.** This is the most fundamental aspect of food security. Without adequate food availability, there is no need to address other aspects of food security. (*all people ... have sufficient ... food*)
- **Supply sustainability.** Having food to eat at present is important, but having food to eat in the future is equally important. If “food availability” is about food supply today, then “supply sustainability” is about food availability for the future. (*all people, at all times, have ... sufficient ... food*)
- **Food quality and safety.** Food needs to have acceptable quality with basic required nutrition and are safe to consume. Otherwise, the functions of foods are not fulfilled or they even cause health problems. (*safe and nutritious food that meets their dietary needs*)
- **Cultural acceptability.** Some foods may be not accepted by some groups of people due to different preferences. Hence, while available, foods also need to be culturally acceptable. (*food that meets their ... food preferences*)
- **Access to food.** Foods need to be available within a reasonable distance. They also need to be affordable by all people, esp., those low-income people. (*all people ... have physical and economic access to ... food*).

To evaluate a country’s food security, evaluation frameworks are required. Ideally, such frameworks should give attention to not only the features of the food itself, but also the range of factors determining the security of food availability and access. Currently, there are a number of evaluation frameworks available; for example, Oshaug et al. (1994); Riely et al. (1999); EIU (2014); FAO (2014a). In this paper, the Oshaug-Eide-Eide framework is followed.

Oshaug et al. proposed a normative food security framework in an article they published in *Food Policy* in 1994. They express food security in two major subdivisions: the adequacy of food supply and stability of both food supply and access. Adequacy of food supply means that (1) the overall supply should potentially cover overall nutritional needs in terms of quantity (energy) and quality (provide all essential nutrients); (2) the food is safe (free of toxic factors and contaminants) and of good food quality (taste, texture, etc.); and (3) the types of foodstuffs commonly available (nationally, in local markets, and eventually at the household level) should be culturally acceptable (fit the prevailing food or dietary culture).

Stability of supply and access to food implies environmental sustainability and economic and social stability. Environmental sustainability implies that there is a judicious public and community management of natural resources which have a bearing on the food supply. Economic and social sustainability addresses conditions and mechanisms securing food access. This concerns a just income distribution and effective markets, together with various public and informal support and safety nets. It could be public social security schemes, but also numerous forms of community transactions, self-help and solidarity networks.

The above expression clearly addresses the sub-goals that must be attained for food security to be achieved as a true development goal. Each element can be given a precise content in the given situation through the identification of local standards against which deviations can be assessed. The normative food security framework as proposed by Oshaug et al. (1994) can be

shown in Figure 3.1. In this framework, above the dotted line are targets to attain in order to achieve a country's food security; below the dotted line are examples of policies, strategies and means that help to achieve the targets. Food trade is an important means to help a country to achieve food security. This policy tool was not explicitly indicated in the original diagram by Oshaug et al. (1994). Figure 1 is a slightly modified version of Oshaug et al. (1994) with the trade component added.

[Figure 1 here]

### **3. Current Status of Food Security in China**

Food supply is plentiful in today's China. However, is food abundance equal to food security? Based on the definition and the evaluation framework presented above, China's current food security status is evaluated below.

#### ***Food supply and nutritional adequacy***

At the national level, food supply is abundant. Total output of most food items has increased continuously in the past three decades. On a per capita basis, both food availability and consumption levels have improved. While the consumption of grains declined, that of many other food items, esp., those higher-valued foods, has steadily increased. FAO statistics confirm that nutrition supply in China has been more than adequate in recent years (Table 1).

[Table 1 here]

Not only is the supply generally adequate, the level of nutrition intake is also largely adequate. The latest nation-wide survey of the status of nutrition intake was conducted in late 2002. According to the survey report, nutrition intake by Chinese residents was notably improved and largely adequate (Ministry of Health 2004). The intake of energy and protein is comparable to the Dietary Reference Intakes (DRIs) while fat intake is higher than the DRI.

China also has a sizeable grain reserves. According to FAO, a ratio of cereal stock to cereal utilization on an annual basis at 17-18% would be the minimum necessary to safeguard a country's food security. China does not publicise its reserve levels and the public has no idea about the exact level. Occasionally, government sources may hint that China's reserve level is above or well above the minimum level as prescribed by FAO. There have also been reports that the reserve amount is far too high (Anon. 2013, Duan 2013). China's current annual consumption of cereals (unprocessed) (2010-2012 average) is roughly 500 million tonnes. Then, conservatively China's cereal reserve would be at about 100 million tonnes.

Comfortable food supplies in China are largely attributable to the removal of many strict controls over farmers since the late 1970s. Importing foods based on needs and comparative advantages has also helped to improve China's food supply. The volume of soybean imported each year since 1990 has been sizeable. In 1990, the net import of soybean was 1 mt. In 2104, it has reached about 60 mt.

#### ***Food safety and quality***

While having an adequate amount of food to eat is no longer an issue for most Chinese people, majority of the foods people eat are unfortunately not safe. Food adulteration has

been widespread in the past two decades. If one types the key words, “China’s food safety”, on the internet, it will lead one to many websites showing unsafe food news or facts.

The widespread of unsafe foods in the Chinese market is beyond imagination of any normal person. The number of unethical methods used to adulterate foods is equally beyond imagination of anyone with basic moral standards. For example, it is common that farmers (1) over use pesticides and other chemicals in food production, (2) harvest and sell foods to which pesticides and other chemicals have been applied but the foods are not safe yet for consumption, (3) use prohibited pesticides and other chemicals in heavy doses. Foods produced using highly poisonous chemicals are sold to the market. Farmers only eat the foods they produce without the use of chemicals. Prohibited chemicals are also widely used in feeding animals to promote faster growth and/or to prevent disease; e.g., feeding pigs with clenbuterol hydrochloride to develop more muscle (and less fat) tissues, feeding chicken with excessive carophyll red to produce eggs with red yolks, feeding swamp eel with the pill to enhance their growth (Qiao et al. 2012).

Making matters worse, during food processing and retailing, harmful ingredients or chemicals are added to improve marketability and profitability. For example, chemical whiteners have been used to produce steamed buns to make them look whiter and more attractive to buyers; detergent powder has been added to mix with flour to produce Chinese flour stickers (you tiao) to make it looking larger; meat has been injected with water to increase weight (one would be lucky if the water is clean); the carcinogenic red dye Sudan I has been used to make food look attractive; dishes have been cooked with oils recycled from restaurant drainages; highly poisonous pesticides have been used in the production of hams; and there is the well-known case where melamine has been added to milk.

Two major factors are responsible for such most unpleasant situations. (1) Penalty for producing and selling unsafe foods is too low to discourage such very unethical acts. (2) The surveillance system of the government is so corrupted and is not in a position to clear such problems. There are other important causes as well. (1) The lack of consciences and the collapse of most elementary moral standards in the society: some selfish individuals do anything without any boundaries for the sake of chasing money. (2) The lack of media freedom: media people cannot or are not able to thoroughly trace and report sources of adulterated foods. (3) The blind pursuance of GDP: some local officials even choose to cover up or protect food adulteration in their jurisdiction in order to increase GDP.

### ***Cultural acceptability***

There are no major issues as far as cultural acceptability of foods is concerned. Chinese people eat almost anything, including wild animals and plants (and unfortunately also those rare or slow-growth animals or plants), let alone animal offal including that of poultry such as ducks and chicken. They also care about food appearance, presentation and diversity. Cooking professionals and food processing industries have been very innovative in inventing new foods for their customers. Hence, in general, cultural acceptability of foods is not a major issue in China.

While Han nationality population dominates in China (accounting for over 95 per cent of the total population), there is also a sizeable Muslim population (second to the Han people, about 2 per cent of the total population). Muslim people have dietary habits that require special catering, esp., in the supply of beef and lamb, in addition to various other Halal-certified

foods. Food supply to cater for such needs occupies an important place in the CPC government's overall food supply plan due to associated political sensitivities in dealing with the Muslim population. In August 2013, the Chinese government publicised its 2013-2020 national plan for beef and lamb production. The importance of ensuring adequate supply of beef and lamb to the Muslim population was emphasised in the very first sentence of the plan (Government of China 2013).

### ***Environmental sustainability***

China's recent fast economic growth has placed enormous strains on agricultural production resources in two major ways. One is the deviation of precious resources (chiefly, land and water) for non-agricultural uses; and the other is the serious damage to the quality of agricultural production resources through pollution to air, water and soil. Both have great ramifications on future food production capabilities, thus food security.

At the beginning of China's economic take-off in the 1980s, little attention was spared to the management of natural resources for sustainable use. Over the past three decades, the damage to the environment occurred and accumulated. Today, environmental degradation in China is very serious and widespread. A stroll around the fields in China's rural areas, esp., in those very populous regions, one will easily spot many polluted water bodies or water courses. Looking at the waters is quite distressing, imagining that they are used to water crops and produce aquatic foods. Given that a large amount of foods is produced in vastly degraded environment, it makes producing safe and quality foods formidable.

There have been increased efforts, from both the governments and some small environment conscious groups, to curtail the damage to the environment. Unfortunately, pollution to the environment continues in China today. Some firms continue to pollute water courses, soil and the air, illegally or sometimes even with the "protection" from local authorities (addicted to pursuing higher GDP growth, many local governments tolerate or allow firms to pollute the environment). When firms are required to treat the pollutants they discharge, instead of doing the right thing to treat and reduce and avoid pollution, many of them find ways to cheat in order to keep their costs low. For example, there have been reports that some firms dig wells and inject pollutants into deep soil, causing pollution to underground water (Beijing News 2013, Dai 2013). Such practice will cause enormous prolonged consequences to the land and water resources which will take centuries to fix, if possible at all. Other ways through which the environment is damaged include chemical residues from farming activities and the huge amount of emissions from the large and increasing number of motor vehicles.

The severe pollution to the natural resources has made producing foods that meet safety and quality requirements impossible. How the damaged environment will affect the quantity of foods produced in the future is to be seen. To restore environment stability and resource use sustainability in China will take a long time and will continue to be an issue that will haunt the Chinese society for a long time to come.

### ***Social stability***

The adequacy of food supply at the national level as presented earlier does not necessarily mean that all people in China have adequate access to foods. Although extreme nutrition deficiency due to lack of food access would be rare, cases exist where households have difficulties in securing an adequate amount of foods. Due to the ever-rising expenses of

education, health care, and accommodation, it happens that some families have to reduce food consumption in order to meet other needs.

It is also common that in today's China some parents still have to financially support their grown-up children who have very low income due to unemployment or very low salary income. The pressure resulting from rising non-food expenditure on low-income households is large and increasing. Unfortunately, due to the high level of inflation, prices for everything, including those of foods, have been rising very quickly in China in recent years (CPI calculation in China does not include house mortgage payments. House price has gone up enormously. For example, in some parts of Beijing, the price in 2014 is 600 per cent higher than that in 2004. Hence, the CPIs published by the Chinese official sources are low estimates and are not comparable to CPIs calculated in other countries).

If family income increases faster than expenditure increases, then the increase in expenditure may not cause too many major financial difficulties. However, in China, wealth has become increasingly concentrated in the hands of a small portion of wealthier residents. The income gap between the rich and the poor has been widening both within and between rural and urban areas (see Figure 2).

[Figure 2 here]

In Figure 2, residents are placed into five quintiles according to their income from low to high. The growing income inequality as shown is disappointing and disturbing, and has become a major cause of concern for social stability. For those low income residents, especially those in rural areas, their income is not even enough to cover normal expenditure. Data shows, during the ten years from 2002 to 2011, for those rural residents falling into the bottom 20% (the first quintile), their savings had been negative. For those falling in the second quintile, they fared only slightly better: out of ten years, they had two negative savings. However, their positive savings in other years are very minimal (SSB, various issues).

The above assessment of the current status of food security in China suggests that, at the national level, Chinese people have plenty food to eat since the 1980s. This is an enormous achievement. In reference to the normative analytical framework, however, there are aspects of food security that represent major challenges for China. These include, among others, concerns over food safety and quality due to the widespread and prolonged existence of deliberate food adulteration; depletion of and pollution to natural resources impacting on long-term sustainable food production and supply; and growing income inequality undermining social stability and the poor's access to food. The several major challenges and their possible countermeasures are addressed below.

#### **4. Improving China's Food Security: Challenges and Countermeasures**

##### ***Preserving food production resources and rehabilitating the environment***

Trade helps a country to improve its food security. However, for China with such a huge population, overly relying on imports to achieve its food security is unrealistic. Where comparative advantages permit, China would need to maintain a high level of food self-sufficiency. The Chinese government is aware of the importance of supplying foods to its citizens primarily with domestic resources. In its 'Outlines of medium- and long-term

national grain security plan (2008-2020)', the government emphasised to achieve 100% self-sufficiency in wheat and rice, and 95 per cent of self-sufficiency in maize (Government of China 2008). While whether this goal is achievable is questionable, it does show that China will try its best to produce most cereals domestically.

A high level of self-sufficiency may be achievable only if China can manage to effectively preserve its food production resources. However, in the past three decades, resources have been continuously deviated away from agriculture for the purpose of industrialisation and urbanisation. The future may see more agricultural resources (chiefly, land and water) to be used for non-agricultural purposes due to lower comparative advantage of agricultural production. Given the limited natural resources China has, balancing the conflicting needs from agricultural and non-agricultural use represents a major challenge for the Chinese government.

Safeguarding the quality of resources is another important part of preserving China's food production capacity. Otherwise, some of these resources may become unsuitable for producing foods or could only produce foods of low safety and quality standards. Given that much of the Chinese environment has been severely damaged, it is imperative for China to rehabilitate the environment.

Despite some recent efforts to protect and rehabilitate the environment, pollution to the environment continues. To rehabilitate the environment, China first has to curtail and eventually stop polluting the environment. This requires firms not to discharge untreated pollutants, farmers to use agricultural chemicals appropriately and farm sustainably, and ordinary citizens to reduce their wastes and dispose of their wastes responsibly.

Education is the key to encourage Chinese citizens to be more environment-conscious and friendly. Policing environment unfriendly acts by firm owners, factory workers, farmers and the general public is not practical. When all citizens become conscious to protect the environment, environment damage will be reduced. Severe penalties should be applied to those who deliberately damage the environment resulting in serious consequences.

### ***Unsafe and poor quality foods***

The other major challenge is to provide safe foods for the public to consume. As noted above, China's widespread and heavily polluted water, soil and air have already made it so difficult to produce safe foods. Added to this, many food producers deliberately contaminate the foods. As such, the logic for China to produce safe foods is first to prevent deliberate food contamination (including both farmers' inappropriate use of chemicals and adulteration by food processors) and then rehabilitate the environment to ensure resources available in the future are able to produce safe foods.

Unfortunately, forbidding the production and selling of adulterated foods in China's today's social, political and economic environment is impossible. (1) It is not possible to eliminate unsafe foods that are produced deliberately. After all, unsafe foods are produced by human beings. It is just impossible for the current system to prevent or discourage some elements in the society from producing unsafe foods. (2) Chinese consumers are too tolerant. In February each year, two government media agents, China Net and People's Daily, conduct a survey on the internet to solicit opinions of the Chinese netizens (internet users in China are often referred to as netizens) on various aspects of their lives. The proportion of the respondents

who are worried about the safety of foods is as high as 96%. However, only 35% indicated they would do something, e.g., to lodge a complaint. 3% could not care less. The remaining 62% choose to tolerate because they did not know where to lodge a complaint (Anon. 2012, Yu 2013). If so many people still buy those foods of dubious quality, crappy foods will be produced and sold to the market because the penalty for producing such foods is so light even if one is found.

It is a huge challenge for the Chinese authority to be able to provide safe foods for its citizens anytime sooner. (1) The country's quality and safety surveillance system is so corrupted. The current institutional arrangements indulge corruption. Without substantial institutional reforms, corruption cannot be curtailed and subsequently it is impossible for the quality and safety surveillance system to perform its monitoring role as expected. (2) It will take a long time, if ever, for those farmers and food processing operators who deliberately pollute foods to stop their unethical acts. There is little hope that these people will lift their ethical standards any sooner through exercising self-conscience. (3) Even if the above two problems could be rectified soon, treating the polluted soil and underground water will take a much longer time. Hence, China may not be able to produce safe foods for a long time to come.

Despite the difficulties, efforts still need to be made to reduce and ultimately eliminate heavily contaminated foods produced on farm and deliberately adulterated foods from food-processing facilities. In addition to legal and economic means, helping citizens re-establish basic social moral standards is important. This can be more effective than any other approaches in eliminating unsafe foods. Also, senior government officials should eat foods of the same sources as the general public. In China, senior government officials have their foods supplied through special channels and safety is guaranteed. All citizens are equal. There are no justifications for the general public to have to tolerate unsafe foods while senior officials can consume safe foods. When senior government officials are immune from eating unsafe foods, they would suffer from "disincentive problem" and would not work hard enough to reduce or eliminate unsafe foods in the market.

### ***Income inequality***

The large and increasing income gap as shown in Figure 2 is a major cause of concern for social stability. In Figure 2, the income gap between the top 20% and bottom 20% of consumers is very large. The gap is even larger if the income of the top 5% of the rich is compared to that of the bottom 5% of the poor. According to the China Family Panel Studies (CFPS) conducted by the Institute of Social Science Survey at Beijing University, in 2012 total income received by the bottom 5% families accounted for 0.1% of the total income of all Chinese families. For the top 5% families, they received 23.4% of the total income of all Chinese families. That is, the income of top families is 234 times more than that of bottom families' (Du and Shi 2013).

The Gini coefficient is commonly used as a measure of inequality of income or wealth. In 2000, the Chinese government estimated China's Gini coefficient to be 0.412, higher than the warning level of 0.4 set by the United Nations. By 2012, it had increased to 0.474. It is crucially important for China to quickly rectify the alarming income disparity problem. Unfortunately, effectively increasing the income of rural people and low-income urban people and reducing the income gap is unlikely in the near future. The CPC government has made efforts to reform the income distribution system. However, some major interest groups have always tried to block the reform. If such blockages cannot be removed, income disparity

will only become larger in China (Qian 2013). Without substantial reforms to the current institutional arrangements, reducing China's income inequality to an acceptable level is not possible.

### ***Food wastes***

The amount of food wasted in China is very high. In addition to food wastes during storage, transportation and processing, foods wasted on dining tables are also enormous. There are also intangible food wastes. That is, some people eat more than their body needs; resulting in excessive nutrition intake and the subsequent health problems. If all such wastes could be reduced or avoided, that would place China in a much better position in its food availability.

Achieving a reduction in food wastes between post-harvest and cooking is relatively easy. But reducing and avoiding food wastes during consumption is not. Such wasteful practices are largely rooted in the country's culture: when entertaining others – either at private functions or for business purposes, the hosts tend to show their hospitality by having a lot of foods. Some people order excessive foods simply because they think they are rich and they can afford (as a way to show off) or the dining is paid using public money.

To fix any of the problems will not be easy; to educate people to change their wasteful habits takes time and to ensure the legitimate use of public money for non-wasteful food consumption for official occasions requires serious political reforms so that officials are held accountable for their actions. Nonetheless, any efforts to reduce food wastes on the dining tables and from excessive food intake will help improve China's food availability.

### ***Non-transparency of Grain Reserve Management***

Having an adequate amount of grain reserves is an important tool to manage a country's food security. China has a reserve stock being at least 100 million tonnes as noted earlier. This is comparable or even higher than the level as suggested by FAO (18% of annual consumption). However, the actual level of grain reserves is not known to the public. The secrecy does not help China to manage its grain market nor the international community to stabilise the world grain market due to speculation problem. Even worse, the secrecy indulges rent-seeking behaviour, significantly increasing reserve management cost.

The argument for this secrecy is that keeping grain reserve information secret is of strategic significance due to the large population in China (being 1.39 billion in 2014). As a matter of fact, India also has a large population (being 1.27 billion in 2014) but the Indian government publicises the level of its grain reserves to the market on a regular basis. India's reserve stock norm is around 16-18 million tonnes in recent years. Indians would outcry about the excessive stock if its reserve stock was some 20-40 million tonnes over its norm as happened during 2001 and 2003 (i.e., if the total stock is in the vicinity of 40-60 million tonnes). Ironically, the Chinese are often concerned about their grain security although its reserve is about 100 million tonnes or even much higher.

Two reasons explain this paradox. One is that some greedy and corrupted individuals who manage the grain reserves abuse the system for private gains. They take advantage of the public and government's concern over grain security and coerce the government to have more grains in the reserve so that there is greater room for them to manipulate the reserves for personal gains (Anon. 2009). The other is that no one is probably sure about the actual

level of the reserve (Moli 2008, Wang 2008, Zhang 2008). By having “more” in the reserve, it would be unlikely all grain warehouses would have less grain than they should (due to manipulation by those greedy individuals); therefore, it would be safer.

Bringing transparency to grain reserve management in China will be most beneficial. It helps (1) eliminate rent-seeking; (2) reduce the reserve quantity leading to a huge financial savings; and (3) manage China’s food security by making better use of the world market.

Transparency of China’s reserve management can also help producers and traders from both China and the rest of the world to adjust their production and business activities in response to changes in China’s reserve levels; hence, reducing fluctuations caused by over speculation. This way, it also helps other countries to manage their food security, a contribution to global food security.

Publicising the level of grain reserves and bringing transparency to its grain reserve management requires changes in Chinese senior government officials’ mentality towards the markets (both domestic and international). It also requires changes in the current institutional arrangements that will reduce and eliminate the resistance to transparency from those who hijack the public’s concern over food security for personal gains.

## **5. Discussions**

For China to truly achieve its food security in accordance with the framework as highlighted in Section 2, the above elaborated major challenges have to be dealt with. To handle these challenges successfully, however, further reforms to the current governmental, economic, and social and cultural institutions would be needed.

Earlier discussions have frequently indicated that governments and officials’ lack of being accountable to the people. They can afford to be not accountable to the people because they were not elected by the people. This weakens China’s ability to improve its food security. Governments and officials can do whatever they want without due considerations over the consequences of their actions or policies. Pursuing higher GDP at the expense of environment sustainability clearly has compromised the provision of safe and quality foods for the Chinese people and undermined the country’s ability to produce foods in the future.

A closely related major issue is the widespread corruption in China. The one-party governmental arrangement and lack of media freedom have all indulged the corruption. The widespread corruption has badly distorted many operations in the Chinese society today. Through offering or soliciting bribes, any unethical deals can be reached such as letting the production of unsafe foods and pollution of the environment. Innovative reforms to the current governmental institutions are called for to ensure governments and their officials at various levels are held accountable to the people under their jurisdiction; this in turn will also help curtail corruption.

Ensuring policy-making process transparent is another very useful avenue to pursue to improve China’s food security. Without transparency, greedy officials have the convenience to corrupt, and in the case of food security, to manipulate food reserve for personal gains. With transparency, the public have the power to stop officials from abusing their power. Media freedom is also essential to keep government officials under check. Reforms to current governmental institutions to ensure governments and their officials to be accountable to the people, to have transparent policy process, and to have efficient government operations are

essential to improve China's food security. Such reforms are also prerequisite for necessary changes in other institutions such as economic and social settings to take place in China.

As noted earlier, domestic grain production will continue to occupy a very important place in China's food supply and thus its future food security. In the past years China's grain production has been at a high level. For China to continue producing at a high level, one obstacle is the very small farm size which has restricted grain output. To increase the scale of farm operations, private property rights policy for land could be very effective. However, to use property rights policy for land to replace the so-called collective land ownership requires the changes in the governmental institutions in the first instance.

Currently, rural land is collectively owned. But who is the "collective" is not clearly defined. In a sense, the collective is largely non-existent. This has encouraged village chiefs and local government officials to capitalise on land transactions for private gains, thanks to the convenience offered by the "collective land ownership". Not only has this imaginary ownership enabled the unnecessary loss of much arable land for non-farming use, it has also made it difficult for the scale of farm operation to enlarge. Research has shown that farms with larger grain production scale achieve higher yields and higher income (Zhan et al. 2012).

Social stability is one crucial aspect of food security. Equitable income distribution improves social stability. The current enlarging gap between the rich and poor in China calls for measures for more equitable income distribution. This requires breaking the obstacles erected by some interest groups to retard fairer income distribution. To break such obstacles is impossible without necessary reforms to the current governmental and economic institutions.

Cultural changes are also needed to reduce food wastes and to eat healthily and responsibly. Showing off one's wealth through wasting foods should be made a public disgrace. Education should be provided to the public to eat healthily with balanced nutrition intake but with minimal and no food wastes. The public may be encouraged to shift from Chinese-style commune dining to separatist dining to avoid excessive foods being provided to the dining table. The public should also be educated to eat responsibly so that they are discouraged from eating rare or slow-growth animals or plants in order to preserve threatened bio species for better future food security.

## **6. Concluding Comments and Implications**

In the past three decades, China has remarkably improved its food availability. While the comfortable food availability is highly commendable, China has not been able to achieve a high level of food security. This paper argues that institutions have hindered China to achieve a higher level of food security. The institutional arrangements are directly responsible for the persistence of unsafe foods and low quality foods in the market, for indulging some greedy individuals to continue accumulating wealth by unfair means and undermining social stability, and for making the already-fragile environment subject to continued damage.

Innovative reforms are needed to improve the current institutional arrangements. Most importantly, changes are needed to ensure the establishment of a governmental institution that will ensure that government operations are efficient, government policy processes are transparent, and government official are accountable to the people under their jurisdiction. Without substantial reforms to the current institutional arrangements, to significantly improve China's food security is not possible.

## References

- Anon. (2009), 'The real story at China's grain reserve warehouse as told by a warehouse worker: too greedy!' [http://koudai.360.cn/u/18116401/article\\_153184202.html?s=y#](http://koudai.360.cn/u/18116401/article_153184202.html?s=y#), accessed 23 June 2009.
- Anon. (2012), 'Current status of unsafe food problems: 60% choose to tolerate' (26 February 2012), available at <http://my.icxo.com/4128579/viewspace-1716088.html>, accessed 3 November 2013.
- Anon. (2013), 'What led to excessive grain reserves in China' (5 June 2013), available at <http://cblog.chinadaily.com.cn/blog-146420-4509496.html>, accessed 31 October 2013.
- Beijing Evening News (2013), 'Highly poisonous pesticides are widely available, farmers only eat the vegetables they produce for themselves', available at <http://www.chinanews.com/gn/2013/06-28/4982205.shtml>, accessed 30 June 2013.
- Dai, J.Y. (2013), 'Rapid economic expansion and the detrimental impacts on future generations', available at <http://www.aisixiang.com/data/61365.html>, accessed 1 March 2013.
- Du, Q. and Shi, H. (2013), 'Survey shows the income of top 5 per cent high-income families is 234 times of that of bottom 5 per cent low-income families', available at [http://news.xinhuanet.com/world/2013-07/18/c\\_125025474.htm](http://news.xinhuanet.com/world/2013-07/18/c_125025474.htm), accessed 13 August 2013.
- Duan, Y.W. (2013), "'Maintaining China's arable land to be no less than 1.8 billion mu" should be abandoned', in Duan, Y.W. (2013), *50 Truths that Chinese Economists Dare not to Tell You*, 2nd edn, Enrich Publishing, Hong Kong, Chapter 28, pp. 157-162.
- EIU (2014), Global Food Security Index 2014: An annual measure of the state of global food security, The Economist, available at <http://foodsecurityindex.eiu.com/>, accessed 30 September 2014.
- FAO (2014a), 'Food security methodology', available at <http://www.fao.org/economic/ess/ess-fs/fs-methods/fs-methods1/en/>, accessed 10 November 2014.
- FAO (2014b), *Food Balance Sheets*. Available at <http://faostat3.fao.org/faostat-gateway/go/to/download/FB/FB/E>, accessed 15 April 2014.
- FAO (2014c), *Food Security Indicators*. Available at [http://faostat3.fao.org/faostat-gateway/go/to/download/D/\\*E](http://faostat3.fao.org/faostat-gateway/go/to/download/D/*E), accessed 23 April 2014.
- FAO and WHO (1992), *Major Issues for Nutrition Strategies*, Rome.
- Government of China (2008), 'Outlines of medium- and long-term national grain security plan (2008-2020)', [www.gov.cn](http://www.gov.cn), 13 November 2008, accessed 15 December 2008.
- Government of China (2013), '2013-2020 national plan for beef and lamb production', available at <http://www.ndrc.gov.cn/zcfb/zcfbghwb/201402/P020140221362074574291.pdf>, accessed 18 August 2014.
- Hodgson, G.M. (2006), 'What are institutions', *Journal of Economic Issues*, Vol. 40, pp. 1-25.
- Ministry of Health (2004), 'Nutrition and health status of Chinese residents', 12 October 2004, available at: [http://news3.xinhuanet.com/forum/2004-10/12/content\\_2087980.htm](http://news3.xinhuanet.com/forum/2004-10/12/content_2087980.htm), accessed 30/10/2013.
- Moli, Z.T. (2008), 'Empty grain warehouse: reserve grains were stolen from the largest grain warehouse in China's northeast', 4 May 2008, <http://cache.tianya.cn/publicforum/content/free/1/1214420.shtml>, accessed 1 June 2009.

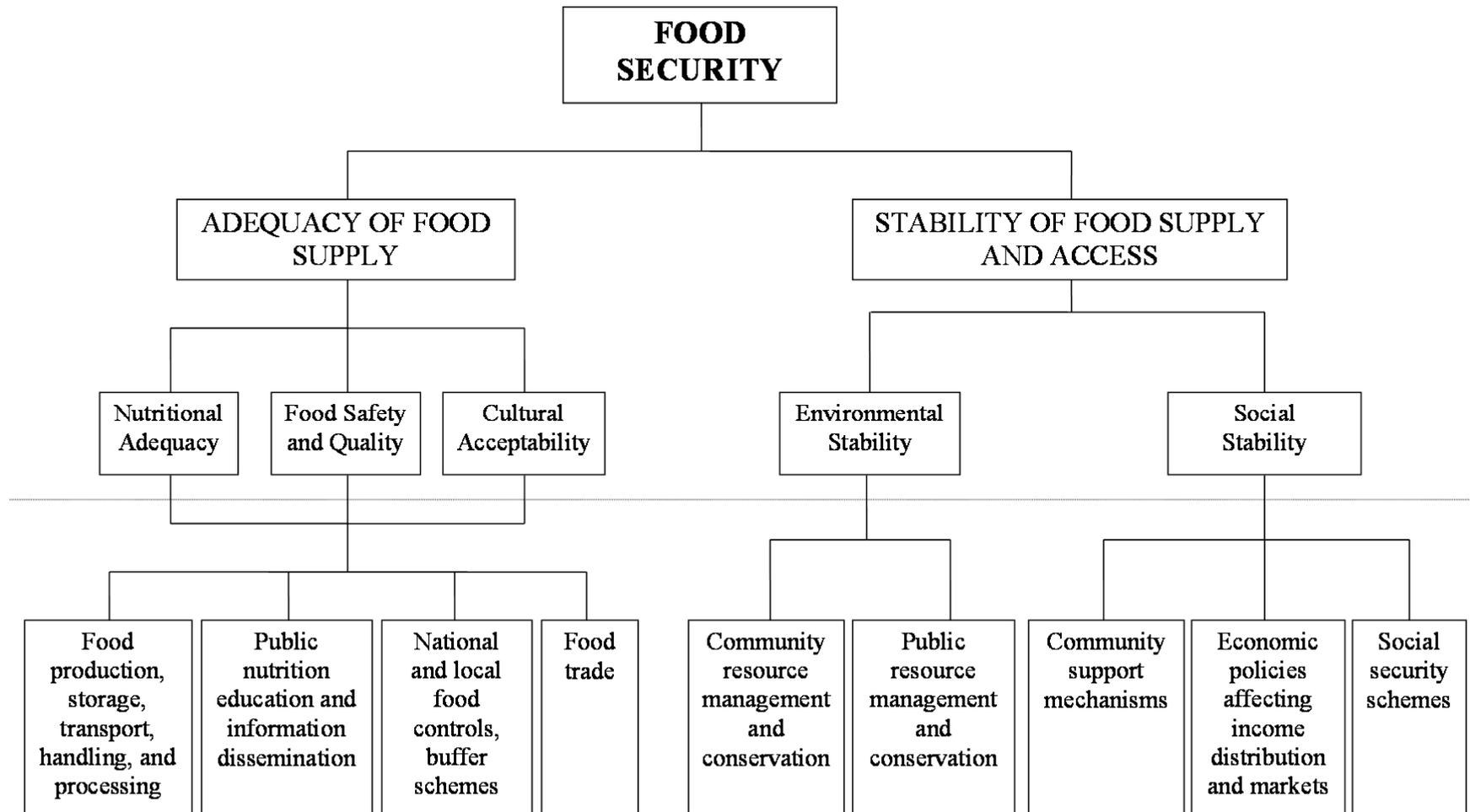
- Oshaug, A, Eide, W B, and Eide, A (1994), 'Human rights: a normative basis for food and nutrition-relevant policies', *Food Policy*, Vol. 19, pp. 491-516.
- Qian, G.L. (2013), 'Reforms on income distribution must avoid influences of interest groups', available at [http://news.xinhuanet.com/comments/2013-01/02/c\\_114224618.htm](http://news.xinhuanet.com/comments/2013-01/02/c_114224618.htm), accessed 1 August 2013.
- Qiao, G.H., Guo, T. and Klein, K.K. (2012), 'Melamine and other food safety and health scares in China: Comparing households with and without young children', *Food Control*, Vol. 26. pp. 378-386.
- Riely, F., Mock, N., Kenefick, E., Cogill, B. and Bailey, L. (1999), 'Food security indicators and framework for use in the monitoring and evaluation of food aid programs', Food and Nutrition Technical Assistance, USAID, available at [http://pdf.usaid.gov/pdf\\_docs/PNACG170.pdf](http://pdf.usaid.gov/pdf_docs/PNACG170.pdf), accessed 10 November 2014.
- Spitz, P. (1985), 'The right to food in historical perspective', *Food Policy*, Vol. 10, pp. 306-316.
- SSB (State Statistical Bureau) (2014), *China Statistical Yearbook*, 2014 and earlier issues, China Statistical Press, Beijing.
- Wang, X.D. (2008), 'How many grain reserves do we have? A report from a disguised inspection of local grain warehouses', *21st Century Economic News*, <http://futures.hexun.com/2008-04-05/105015735.html>, accessed 15 May 2009.
- World Food Conference (1974), Report of the Council of FAO, Sixty-Fourth Session, Rome, 18–29 November 1974.
- World Food Summit (1996), Rome Declaration on World Food Security, 13-17 November 1996, Rome.
- World Summit on Food Security (2009), Declaration of the World Summit on Food Security, 16-18 November 2009, Rome.
- Yu, Z.G. (2013), '96% of netizens are concerned about food safety' (26 February 2013), available at [http://opinion.china.com.cn/opinion\\_52\\_65252.html](http://opinion.china.com.cn/opinion_52_65252.html), accessed 3 November 2013.
- Zhan, J.T., Wu, Y.R., Zhang, and Zhou, Z.Y. (2012), 'Why do farmers quit from grain production in China: causes and implications', *China Agricultural Economic Review*, Vol. 4, pp. 342-362.
- Zhang, T.W. (2008), 'Empty grain warehouse: an important warning signal that deserves serious attention', 12 May 2008, *Beijing Youth Newspaper*, [http://news.xinhuanet.com/comments/2008-05/12/content\\_8148770.htm](http://news.xinhuanet.com/comments/2008-05/12/content_8148770.htm), accessed 1 June 2009.
- Zhou, Z.Y. (2010), 'Achieving food security in China: past three decades and beyond', *China Agricultural Economic Review*, Vol. 2, pp. 251-275.
- Zhou, Z.Y. (2015), 'Food security in China: past, present and the future', in Nagothu, U.S. (ed.), *Food Security and Development: Country Case Studies*, Routledge, London.

Table 1. Nutrition Supply Adequacy in China (1990-2014)

	Dietary Energy Supply (DES)	Average Dietary Energy Requirement (ADER)	Average dietary energy supply adequacy (DES/ADER)	Average protein supply	Average fat supply
	(kcal/caput/day)	(kcal/caput/day)	(%)	(gr/caput/day)	(gr/caput/day)
(1)	(2)	(3)	(4)=(2)/(3)	(5)	(6)
1990-92	2475	2333	106	65	55
1991-93	2488	2336	106	67	57
1992-94	2544	2343	109	70	60
1993-95	2622	2351	112	73	63
1994-96	2673	2361	113	76	65
1995-97	2712	2372	114	78	67
1996-98	2737	2382	115	79	68
1997-99	2760	2391	115	80	71
1998-00	2786	2401	116	82	73
1999-01	2800	2411	116	83	75
2000-02	2822	2421	117	84	76
2001-03	2829	2431	116	84	78
2002-04	2843	2440	117	85	79
2003-05	2858	2448	117	86	81
2004-06	2874	2453	117	87	83
2005-07	2894	2457	118	88	85
2006-08	2925	2459	119	89	87
2007-09	2961	2460	120	91	89
2008-10	3003	2460	122	93	92
2009-11	3036	2459	123	94	93
2010-12	3064	2457	125		
2011-13	3086	2454	126		
2012-14	3102	2450	127		

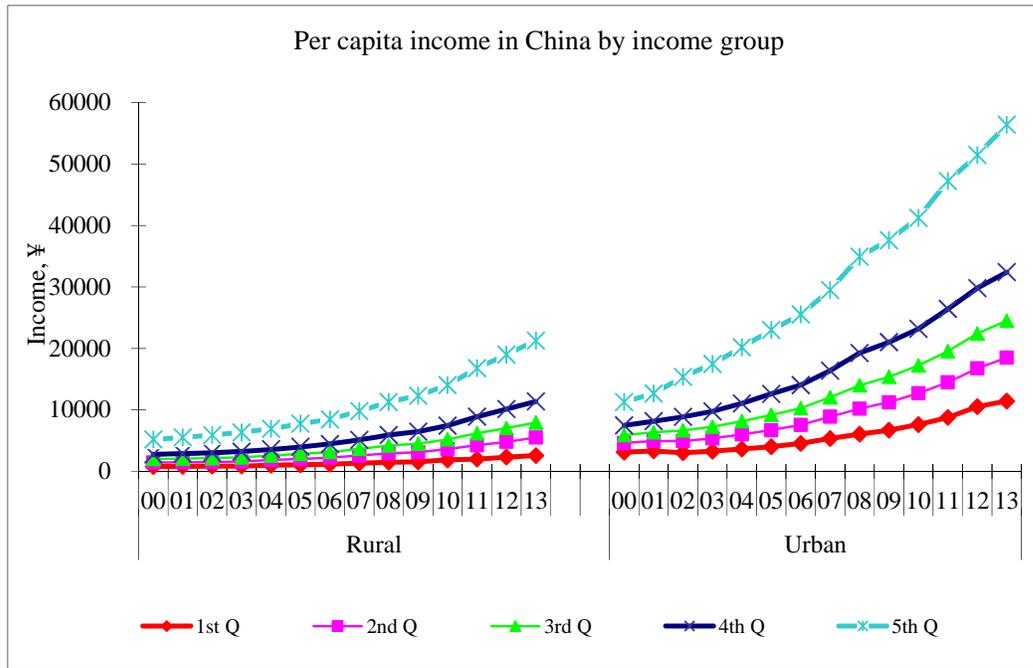
Sources: FAO (2014b and c).

Figure 1. A Normative Food Security Framework



Note: above dotted line = guiding principles; below dotted line = examples of policies and strategies.  
 Source: based on Oshaug, Eide, and Eide (1994).

Figure 2. Growing Income Disparities between the Rich and Poor



Source: SSB, various issues.