



Ensuring the food Security of a Populous Nation

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The national grains security strategy that takes our side as the dominant factor, bases itself on its own country, guarantees the production capacity, imports appropriately and has the support of the science and technology sector through No.1 Document of CPC for 2014, is of great significance for ensuring the issue of feeding China's population of 1.3 billion people.

1. What are the reasons for the continuous increase of grains in the recent ten years?

The National Bureau of Statistics announced that, in 2013, China's total grain output reached 601.94 million tons, and increased by 2.1% over the last year, achieving the first time of "continuous increase of grains in the recent ten years" since 1949. At the same time, some other important agricultural products, such as sugar, oil, milk, fruit, vegetable, tea, and aquatic products are under all-round development, and the traditional pattern that there exists a reciprocal relationship between grain and economic crops is successfully broken.

In conclusion, there are three main reasons that lead to the continuous increase of grains in the recent ten years.

(1) The advancement of technology results in the increase of grains yield per unit area. In the recent 10 years, the agricultural science and technology sector in China has made considerable progress; in 2011, the contribution rate of science and technology to agricultural production reached 53.5%. In 2010, the total power of agricultural machinery of the country reached 0.928 billion kilowatts, and the structure of agricultural equipment continues to be optimized; high-power, multi-function, high-performance agricultural machinery and those in weak points are growing rapidly. The comprehensive mechanization level of crops in farming and harvesting has reached 52.3%, which is improved by 16.4% compared to the end of the period of the 10th "five-year plan", and annually increased by 3.3%, far higher than the annual growth rate of 0.7% during the period of the 10th "five-year plan". The mode of agricultural production has realized the historic leap from the manual mode operation to the mechanical operation dominant mode. The production mechanization of main grain crops is promoted rapidly, wheat production has basically realized the mechanization of the whole process; the machinery planting

level of rice has been improved from 7% in 2005 to 35% in 2013; and the machinery harvesting level of corn has been improved from 4% to 49%. Main agricultural products basically gain the realization of improved variety; and some new varieties, such as “super rice”, “super wheat” have come out in succession, hybrid corn has also experienced two updates. During the recent 10 years, the contribution rate that results from the factor of unit yield increase to the continuous increase of grains production is over 65%. With the application of integrated technology system, such as thoroughbred fine law supporting, agricultural machinery and agronomy fusion, China has already formed an effective technology demonstration and promotion system in high yielding varieties, cultivation techniques and the level of agricultural mechanization.

- (2) Appropriate policy arouses the enthusiasm of producers. Up to 2012, the total investments that has been supported by the national finance on agriculture amounts to over 5,000 billion yuan. From that figure, the national fiscal investment on agriculture has been increased from 233.76 billion yuan to 1,172.35 billion yuan these 10 years, an increase of more than five times; in terms of speed, the annual growth rate of national fiscal investments on agriculture is 23.9%, higher than the fiscal expenditure of the same period annual growth rate of 2.8%; from that proportion, the proportion of national fiscal expenditure on agriculture of fiscal expenditure has been increased from 8.2% to 9.2%, reaching, nearly 1/10. From 2002, when the soybean seed subsidies began to be implemented, up to now, the agricultural subsidy system that takes the “four subsidies” as the core has been basically formed. The amount of subsidies increased from 0.1 billion yuan of 2002 to 165.3 billion yuan in 2012, and the amount of “four subsidies” add up to 763.1 billion yuan in ten years; only in 2013, the amount of subsidies reached up to 170 billion yuan, and the standards of subsidies continue to be improved, and the scope of subsidies continues to be expanded. Not only that. The inputs of all aspects, such as agricultural insurance, small irrigation and water conservancy construction and land consolidation continue to increase, the fundamental position of agriculture is increasingly strong.
- (3) The development of new types of agricultural operators makes agriculture gradually become a “decent occupation”. Since 2008, the Third Plenary Session of the 17th CPC Central Committee emphasized that “give the farmers more sufficient and guaranteed right of land contractual management, and the existing land contractual relationships remain stable and unchanged for a long time”, the rural land contractual relations are increasingly stable, and the land circulation speeds up significantly, presenting the trend of concentrating on new types of agricultural entities. Up to the end of June 2014, the circulation area of contracted arable land reaches 0.314 billion *mu* ($1\text{ mu} = 666.6\text{ square meters}$), accounting for 23.9% of the farmers’ contracted arable land all over the country, among which, the land that flows into farmers, cooperatives and agricultural enterprises respectively accounts for 61.8%, 18.9% and 9.7% respectively. The number of the households who cultivate arable land with an area of above 30 *mu* accounts to 8.91 million. Family farms reached 0.877 million, whose cultivated arable land area is 200 *mu* on average, and their business income is significantly more than that of general farmers, becoming “the most respectable farmers”. According to the results of our survey, in some places, such as Anhui province, after the land is circulated and contiguous planting is

formed, the actual area for using can be more than 5-10% due to flattening; the management efficiency of large-scale households and grains cooperatives are respectively 1.5 times and 2.1 times higher than that of general households. This improves the grains production efficiency to a large extent, and then makes the outputs of grains exceed 600 billion kg when grains production made continuous increase over the past ten years.

2. What problems still exist?

- (1) Since 2004, the implementation of minimum purchase price continuously pushes the rising of domestic grains price, and distorts the price formation mechanism. In 2004, the minimum protection price of rice was implemented, which expanded to wheat in 2006, and in 2008 temporary collection and storage policy of corn, soybean and rapeseed were launched, and the three main grains were all brought into the price protection range of the government. While this policy effectively protected the interests of farmers, it also brought a series of negative effects. First, in recent the ten years, the price of the three main grains rose by 5%-10% annually, and it has not fallen yet; market mechanism did not work at all in the allocation of grains resource, and then we can say that China's grains market is "policy market" or "government market", which is also opposite to the spirit of the Third Plenary Session of Eighteenth CPC Central Committee. Second, the process of adjustment of agricultural structure is delayed. Because the country takes the policies of purchase of protective price and temporary collection and storage of grains, however, the prices of other agricultural products almost completely fluctuate in line with market conditions; therefore, main members of many families who work outside or farmers who have an aversion to market risks switch to plant other crops as grain crops in order to avoid risks. Third, the grain reserve keeps high, and the turnover becomes difficult, making the treasury carry a heavy burden.
- (2) The environmental problems of agriculture have been deteriorating gradually. In a sense, the rising grains production year after year attributed to the use of large amounts of fertilizers and pesticides. The application amount of nitrogen fertilizer on per unit farmland of China is much higher than that of the developed countries in the world. As the data shows, from 1998 to 2009, the application amount of national agricultural fertilizer increased from 40.85 million tons to 54.04 million tons; annual fertilizer consumption of per unit arable land is increased from 315kg/ha to 444kg/ha. Agricultural fertilizer consumption continues to increase, which becomes a source of agricultural non-point source pollution in the local area when it makes some contribution to the increase of grains production. Land depletion, land compaction and soil erosion caused by long-term excessive usage of chemical fertilizers are the main reasons for the rapid decrease of the efficiency of nitrogen fertilizer. The same is true in the case of pesticides. From 1998 to 2009, the amount of pesticide application increased from 1.23 million tons to 1.71million tons, but the utilization rate is only 30%, and it is universal and considered a phenomenon that high toxic pesticide is used. Currently, negative externalities of pesticides begin to appear, such as the claims that they lead to pest and disease outbreaks and play a threat to the health of humans, livestock and poultry. Only the transformation into the development mode, can the grains industry be green, safe and sustainable.
- (3) The imports of main grains tend to increase. In recent years, in addition to soybeans, the

imports of wheat, corn and rice are increasing annually. This demonstrates that following with the improvement of income level, the consumption level of urban and rural residents in China is growing fast. From the structure of main grains' imports, in 2012 the import of rice is 2.31 million tons, accounting for 1.6% of domestic production, and about 6% of the volume of global trade; the import of wheat is 3.69 million tons, accounting for 4.4% of domestic production, and about 2.7% of the volume of global trade; the import of corn is 5.21 million tons, accounting for 3.6% of domestic production, and about 4% of the volume of global trade. The total amount is certainly very small, especially wheat, which basically belongs to that type of import with regulating supply and demand. Comparing the domestic prices (wholesale prices) of the three main grains with the international prices (CIF price after tax), we can see that in January of 2007, the price ratios at home and abroad of corn, wheat and rice are 0.69:1, 0.68:1 and 0.86:1, respectively. Up to July of 2013, the price ratios change into 0.96:1, 0.98:1 and 1.01:1; the price ratios reached 1.16:1, 0.99:1 and 1.24:1 in September of 2013. Viewed in connection with the changes of price ratios in the recent two years, the import of wheat is mainly caused by domestic demand; the imports of corn and rice are caused by demand and price "upside down" collectively. Currently, the domestic prices of corn and rice have been 15%-25% higher than international prices, and if the proportion continues, the phenomenon will continually occur that on one hand, domestic storage is overstocked substantially; on the other hand, the imports increased quickly. Take rice for example. Since the rice prices in Vietnam and other Southeast Asian countries are largely lower than China's, in addition to importing from formal channels, according to unofficial data, in 2012, the southeast Asian rice that flows into China from Yunnan border is about 0.7 million tons, while from Guangxi border is 0.4-0.5 million tons. The smuggling of rice is increasing year by year. However, domestic rice is overstocked substantially, which is not only wasteful, but also increases the financial burden.

3. What should be done in the days to come?

It can be seen from the above analysis that current grains development strategy and grain circulation system have reached a new level, and great reform must be carried out.

- (1) Change the grains supply strategy. Although the grains production of China has been increased successively for ten years, the supply and demand are still labeled as "tight balance of total production and structural shortage". In 2011, take main grains and soybeans importation for example. If China plants these farming products which are net imported by itself, it will need arable land of 0.635 billion *mu*, which is a very large number. If calculated in accordance with planting area of 2.35 billion *mu*, the import quantum is equivalent to 27% of the domestic production. Not only farming products need to be imported, livestock products also need to be imported, and the dependence degree on foreign trade of domestic demand is increasingly high. This requires that we must change the grains supply strategy, and under the premise of "bases itself on our own country, guarantees the production capacity", make full use of the international market, and "moderately import", meeting the growing domestic demand for food. From our own point of view, it is feasible to ensure 95% of three main grains production—self-sufficiency rate; considering the import quantum of soybean, it is also feasible to keep China-caliber-grain (including soybean) self-sufficient rate above 85%,

and adjust it to above 80% in the future. The key is to build the aircraft carrier of agricultural product trade of our own, making it to be of certain competitive power and influence in the international market, and take the initiative of import and export of agricultural products in our own hands.

- (2) Reform the agricultural subsidy system and the minimum purchase price system. Agricultural subsidy is large, despite its low efficiency, it has become a part of farmers' income, and therefore, cannot be cancelled. How to reform? It is proposed to retain the stock, reform the increment, and new subsidies incline to family farms and farmer cooperatives whose land area reaches above a certain scale. The reform direction of the minimum purchase price is marketization, but it must be carried out under the premise that the basic benefits of farmers are guaranteed. The suggestions are as follows: first, multiple subjects are allowed to enter into the market to purchase grains; China Grain Reserves Corporation only purchases national reserve, and local government is responsible for local reserve. Second, the nation signs purchase contracts with family farms, farmer cooperatives and so on in accordance with the protection price in order to guard the basic benefits of these scale bodies, and guide the land to concentrate on this kind of body. Third, the reform of minimum purchase price and agricultural subsidy system should be carried out synergistically to ensure the basic benefits of grains farmers.
- (3) Intensify efforts to promote the construction of a new type of agricultural management main bodies. First, establish the family farms system. Since 2012, the Ministry of Agriculture have established the pilots of family farms in many places all over the country, which have been basically mature; it is proposed that agricultural department and administrative department for Industry and Commerce jointly set up the family farms system, and solve the family farms' problems of loan and insurance etc. through cooperating with financial sector. Second, promote the development of land stock cooperatives. As a part of farmers cooperatives, land stock cooperatives is formed in the way of taking contracted management land of family as stocks by farmers, which is mainly developed from agricultural machinery cooperatives in the northeast, north China and so on, and its mode of operation is completely different from the farmers professional cooperative of "production at home, service in the cooperatives", therefore, farmers' cooperation of stock system should be designed under the framework of "farmers professional cooperatives law", including shares and distribution methods, so that the land stock cooperatives has laws to follow.
- (4) Promote the reform of innovation system of agricultural science and technology. From a long-term perspective, the outlet of solving grain problems lies in science and technology innovation. Currently, China's major scientific research strength is in the universities and scientific research institutions. However, enterprises, as the bodies of technical innovation, are short of scientific research strength; thus, according to the requirements of "opinions about accelerating and promoting the development of modern crop seed industry" and "opinions about deepening the reform of science and technology system, and speeding up the construction of national innovation system" of the CPC Central Committee and State Council, we should speed up the flows of research results and factors into the seed enterprises, and make the enterprises become the main bodies of technical innovation as

soon as possible, creating a national seed industry that can compete with the world's seed giants, such as Mengshandou, Pioneer and so on.

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