China's corn policy shifting into producer compensation system: from price support to direct payment

April 1st, 2017
Norinchukin Research Institute Co., Ltd.
RUAN Wei, Research Counselor

■Abstract

China embarked upon a full-fledged marketization of the economic system at the beginning of the 21st Century, in which Chinese authorities introduced a price support policy for farmers with income transfer being accompanied in order to realize a balanced growth of agriculture with non-agricultural sectors as well as to boost food production in the country. Increases in farmers' income and food production were concurrently achieved by raising the support prices. At the same time, however, this has brought about a reversal of price difference between imported grains and domestically produced ones. In addition, lower tariff rates on imported grains, which China committed itself at its accession to the World Trade Organization (WTO), also caused a rapid inflow of imported cheap grains to the Chinese market. Domestically produced grains lost competiveness in the market, which has resulted in piling unsold grains as government's reserves up to an unprecedented level. Since the year of 2014, China began to change its policy for soybean and corn producers from price support programs to direct payment programs such as a target price system (or deficiency payment) and a producer compensation system. Some effects, including price declines of domestically produced grains and curbed imports, have been already confirmed. Concurrently, however, these policy changes have caused decreases in producers' profits and an amount of domestic production as well.

This paper will focus on China's producer compensation system applied for corn producers. It will also make an analysis on relationship between the new corn policy and the existing domestic support ceilings under the Agreement on Agriculture of WTO, considering possible effects of the policy change not only on Chinese agriculture, but also on the world grain market.

■Introduction

China decided in 2014 to make a significant change in its food security strategy from "absolute food self-sufficiency" to "food security to be ensured by adding imports to its key components" (Ruan 2014). At the same time, Chinese authorities initiated a drastic reform of the "price support policy" that had been playing a key role as the basis for boosting food production.

Food production in China had remarkably increased with production incentives provided

by the price support policy. In the domestic market, however, this production-encouraging policy brought about a reversal of prices that prices of domestically produced grains were almost constantly exceeding those of imported ones in the market for the first time in the modern history of China. As a result, inventories of grains continuously purchased by the government until 2015 expanded to an unprecedentedly large scale. In this background, there was a situation that import of grains sharply increased, since China found it virtually impossible to make its tariff and other boarder measures effectively function as a protection for agricultural commodities produced by domestic farmers, because the contribution of these boarder measures accepted by China at its accession to the World Trade Organization (WTO) in 2001 was much less than that of boarder measures that had been already granted to developed countries. Among several grains, corn surplus stockpiled by the Chinese agencies has reached to as much as twice of the world stock except that of China, which is now casting a heavy burden on the Chinese farm policy as well as the international grain market. China has found it difficult to continue the price support policy for corn and other grains in effective manners and its policy change is now considered inevitable.

On September 13, 2016, the United States of America filed a complaint with WTO alleging China is offering excessive support for local producers of wheat, corn, and rice. The U.S. administration claimed that China's subsidies paid to those producers were estimated to be nearly 100 billion dollars in excess of its WTO commitments, which has been not only encouraging Chinese farmers to boost production, but also hurting U.S. farmers by depressing prices of grains in the world market. The U.S. complaint is based on evolution of China's price support policy, aside from whether U.S. claims are based on facts or not. Meanwhile, the Chinese government itself had already taken steps to reform its price support policy before the U.S. launched the challenge against China at WTO.

Although the price support policy is changed, however, China's principles on food security, which consist of almost absolute self-sufficiency of staple grains such as rice and wheat as well as basic self-sufficiency of feed grains including corn, will be unshakable. In the process of price-support policy reforms aiming at achieving these principles, the Chinese authorities started in 2014 to search for changes from price support systems for soybean and cotton, productions of which are both limited in the country, to "target price systems" (deficiency payment)(Note 1). Based on experiences of these policy changes, the government decided to take steps toward drastically reforming a price support system for corn producers in 2016. Both of demands and reserves of corn in China are considerably huge. The result of the policy reform will have a great influence on the global market of grains as well.

This paper will not only outline the background to the introduction of a "producer compensation system" for corn producers in China and contents of the policy implementation, but also give consideration to its impact on Chinese agriculture and the world grain market. Before that, the paper will focus on factors that made it difficult for the price support system to effectively function. Results of the pilot target price systems for soybean and cotton as well as challenges faced in implementing these systems will also be touched upon.

(Note 1) In another paper written by the author on the price support policy in China (Ruan 2015), the term of "deficiency payment system" was applied to mean target price systems for soybean and cotton producers. In China, however, those deficiency payment systems were named as "target price systems". In this paper, therefore, the "target price system" that is directly translated from the Chinese original term is employed to mean the "deficiency payment system".

1. Factors stalemating China's corn price support system

1.1 Introduction of price support policy

China started to industrialize its economy in early 1950s, just after a nation of China was founded. The resources for industrialization, however, could be squeezed only out of an agricultural sector with few domestic funds being built up and foreign funds scarcely invested in the country. With a view to raising the fund for industrialization, China had continued to implement an exploitative farm policy of the developing country type in a long period from 1950s to the end of the 20th century, which policy was characterized by compulsory deliveries of agricultural products to the governmental agencies at fixed low prices, although the policy regulations were partly revised and eased during the same period.

Economic reform and an open-door policy pursued by China since 1980 promoted investment of foreign funds and exports of Chinese products, which played a leading role to develop its national economy as well as increase people's incomes. Following such achievements of the open-door policy, the Chinese government finally reached a decision in late 1990s to change its agricultural administration from the exploitation farm policy to an agricultural protection policy of the advanced country type. In 2004, when the Chinese authorities entirely abolished the "staple food control regulations (policy of government monopoly)" that had forced farmers since 1953 to sell their agricultural products to the Government at lower prices, a switchover from the exploitation farm policy was completed.

As the food control regulations were put to an end, the Chinese government introduced a price support system, which "applies minimum purchase prices to main items of grains, insufficient in supplies to the market, at major producing areas on the basis of decision to be made by the State Council in order to maintain supplies of those crops in the market as well as to protect profits of farmers".

The new price support policy was gradually put into practice for producers of main commodities exclusively in the respective major producing areas, not throughout the country; rice in 2004, wheat in 2006, corn in 2007, soybean in 2008, rapeseed in 2008, cotton in 2011, and sugar crops in 2011.

At the beginning of the 21st century, China found a way out from its exploitation farm policy. Incomes of Chinese farmers, however, were far less than those in major countries in the world. A great income gap between farmers and workers in non-farm sectors was not yet shrunk in the country, either. On the other hand, a kind of pressure was still exerted on the grain-producing sector to continue increasing food production and maintain a high level of the production for the purpose of feeding a massive population of China. In order to improve the income inequality as well as continuously boost food production, it was really necessary for China to implement the price support policy that had dual effects of income transfer and production incentives.

Under the price support policy, Chinese authorities introduced two different systems according to the degree of significance of respective commodities, namely a "minimum support price procurement program" targeting staple foods of rice and wheat and a "temporary procurement and reserve program" for non-staple farm products (See Table 1).

Since China experienced 2007 sudden rises of grain prices in the world market, the government adopted a policy of increasing domestic production of foods as well as reducing the income inequality between farmers and workers in non-farm sectors by greatly raising the levels of support prices year after year since 2008 to boost the income of farmers facing

an increase in production costs mainly due to wage hikes of farm workers. During a period from 2007 to 2014, the support price for Japonica rice jumped up by as much as 106.7 percent, followed by wheat 71.0 percent up, corn 60.0 percent up, and soybean 24.3 percent up (in a period from 2008 to 2013).

Table 1 China's price support systems for grains

	Minimum support-price procurement policy				Temporary procurement and reserve policy	
	Rice			Wheat	Corn	Soybean
	Early-maturing Indica rice	Medium & late-maturing Indica rice	Japonica rice			
Implementation period	2004 to present			2006 to present	2007 to 2015 (Producer compensation system since 2016)	2008 to 2013 (Target price system since 2014)
Targeted provinces & regions	Anhui, Jiangxi, Hubei, Hunan, and Guangxi (four provinces & one autonomous region)	Anhui, Jiangxi, Hubei, Hunan, Sichuan, Jiangsu, Henan, and Guangxi (seven provinces & one autonomous region)	Jilin, Heilongjiang, and Liaoning (three provinces)	Hebei, Jiangsu, Anhui, Shandong, Henan, and Hubei (six provinces)	Jilin, Heilongjiang, Liaoning, and Inner Mongolia (three provinces & one autonomous region)	Jilin, Heilongjiang, Liaoning, and Inner Mongolia (three provinces & one autonomous region)
Time of price announcement	Prior to seeding	Prior to seeding	Prior to seeding	Prior to seeding	Harvest season	Harvest season
Procurement period	Mid-July to end of September in current year	Mid-September in current year to end of January in following year	Mid-October in current year to end of February in following year	Late-May to end of September in current year	Late-November in current year to end of April in following year	Late-November in current year to end of April in following year

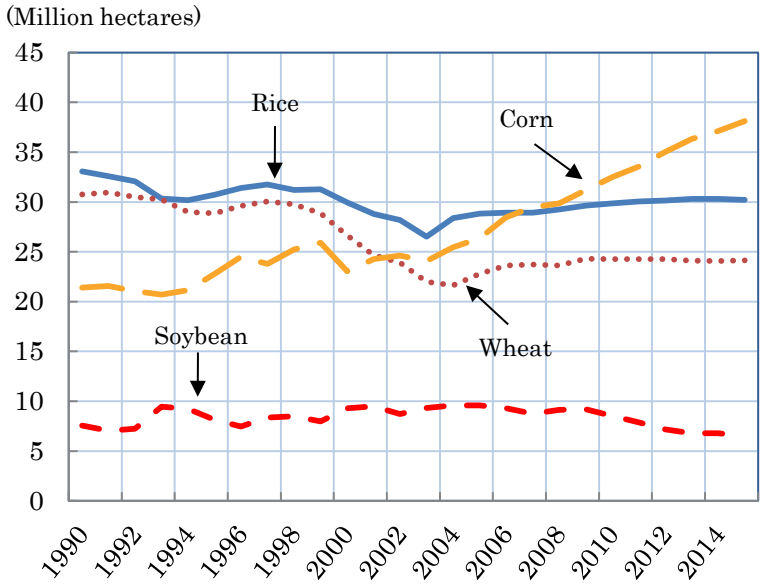
SOURCES: Compiled from information materials of the National Development and Reform Commission.

Thanks to these hikes of support prices, profitability of grain production has been remarkably improved and incomes of grain producers have also increased, which brought about a great boost in grain production for consecutive 12 years ending in 2015.

Among the main grains, production of corn was tremendously boosted by as much as 52.8 percent from 147 million tons in 2007 to 224.63 million tons in 2015. With regard to the planting acreage of corn during the same period, it increased by 29.3 percent from 29.48 million hectares to 38.12 million hectares, expanding corn's share in the total acreage of four major grains such as rice, wheat, corn, and soybean by 6.1 points from 32.4 percent to 38.5 percent (See Figure 1). Heilongjiang province, China's top corn producer, expanded its corn acreage by as many as 1.94 million hectares or 49.9 percent from 3.88 million hectares in 2007 to 5.82 million hectares in 2015, which exceeds Japan's total acreage of farm crops, 4.15 million hectares in 2014, by some 40 percent (See Figure 2). Heilongjiang is a province ranking first in China for an increase in the corn production acreage. Inner Mongolia autonomous region also increased its corn acreage by 1.4 million hectares from 2.013 million hectares in 2007 to 3.407 million hectares in 2015, nearly catching up with Jilin, the second largest corn producing province (3.8 million hectares in 2015). As a result, the share of corn acreages occupied by three provinces and one autonomous region at North East China (Inner Mongolia autonomous region, Liaoning province, Jilin province and

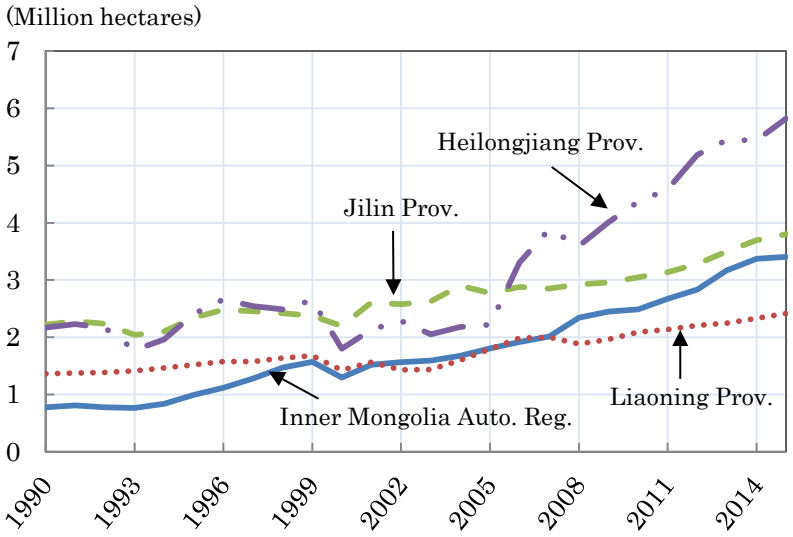
Heilongjiang province; hereinafter referred to as the “three provinces and one region”) in the national total of the acreage reached to 40.5 percent (15.45 million hectares) in 2015, 4 points up from 36.5 percent (10.75 million hectares) in 2007.

Figure 1 Planting acreages of grains in China



SOURCES: Compiled from “China Rural Statistical Yearbook” (1991 to 2015 editions).

Figure 2 Planting acreages of corn at the three provinces and one autonomous region in North East China



SOURCES: “China Rural Statistical Yearbook” (See Figure 1).

The total planting acreage of corn in the three provinces and one region, 15.45 million hectares in 2015, is as much as 61.4 percent larger than that in all the member countries of the European Union, 9.57 million hectares. It is almost equivalent to a corn planting acreage of 15.43 million hectares in Brazil, the third largest corn producer in the world.

In this connection, a corn production boom took place particularly in North East China during the period from 2008 to 2015 because of improved profitability of the production, raising an average rental charge of farmlands for corn production by over three times in the same period. The soaring rental rate of farmlands has become a major factor causing the rise of production costs for farmers who joined the boom of corn production by renting farmlands to expand their planting acreages.

1.2 Imports of corn increased by reversal in domestic and overseas price difference

Since around 2012, however, vulnerability of China's price support policy has begun to be revealed. A price of domestically produced corn started exceeding that of imported corn in the biggest corn consuming province of Guangdong, located on the South China Sea. The difference between the two prices was expanding year after year, and reached up to 63.3 percent in 2015, approaching to China's highest tariff rate of 65 percent being imposed on imported agricultural commodities.

What was regarded as a cause of this problem is a low rate of import tariff that China had been levying to protect its agricultural production. Under the Agreement on Agriculture committed by China at its accession to WTO in 2001, the Chinese government removed non-tariff import barriers and introduced tariff rate quarters (TRQs) for key four commodities of rice, wheat, corn and cotton. In-quota-tariff was fixed at 1 percent for respective import quotas of rice (5.32 million tons), wheat (9.636 million tons), and corn (7.2 million tons), while the secondary tariff rate called as out-of-quota tariff was uniformly set at 65 percent for these three kinds of grain. Namely, in China, a specific rate duty, that is effective to curb an increase in imports when an import price falls, has not been imposed on imports of key agricultural products. What is worse, the out-of-quota tariff of 65 percent was granted to China as its highest tariff rate to be levied on imports of agricultural commodities. It would be easily understood how low China's maximum tariff rate is fixed if the rate is compared with Japan's specific rate duty of 341 yen per kilogram imposed on rice imports (equal to 778 percent in ad valorem tax). Lower tariff rates are applied to most of other commodities as well; 3 percent on soybean, 2 percent on grain sorghum, 1.5 percent on barley, 5 percent on DDGS (Distiller's Dried Grains with Solubles), 6 percent on frozen pork, and 12 percent on beef.

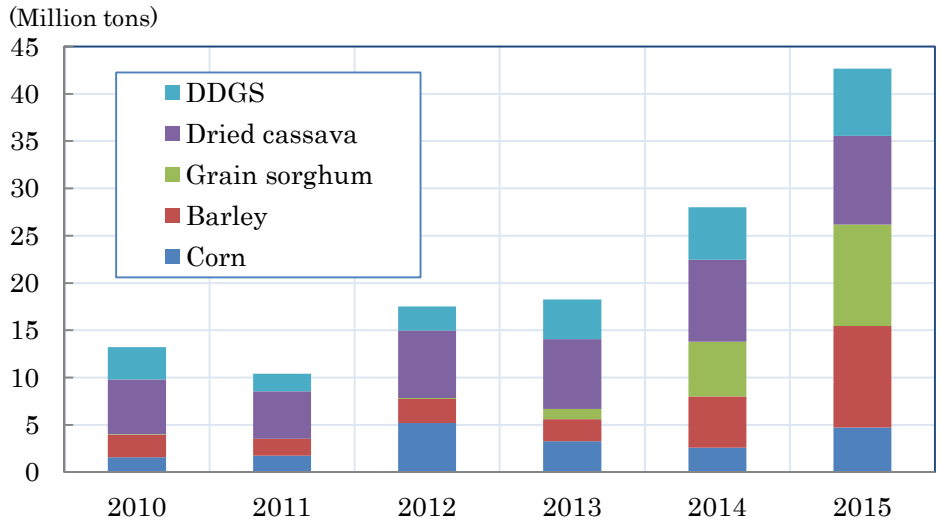
Imports of grains from overseas markets began to rapidly increase since 2012, as local users started purchasing imported grains because domestically produced grains were more expensive than imported ones. Net imports of four commodities such as rice, wheat, corn and soybean rose in 2015 to 92.25 million tons in total, 66.8 percent up from 55.31 million tons in 2011.

China had been importing only a few amounts of corn until 2011, imports of which turned to a sharp increase in 2012. On the other hand, Chinese authorities tightened control over imports of genetically modified organism (GMO) corn variety (MIR162) at the end of 2013, which variety was not authorized in China. Under this import control,

Chinese users such as compound feed manufacturers began to switch its sources of materials from Chinese corn to imported substitutes, triggering massive purchases of the corn substitutes from overseas markets including grain sorghum, barley, DDGS, and cassava. While imports of these substitutes are not restricted even with low tariff quarters, Chinese users' purchases boosted to 25.42 million tons in 2014, 69.5 percent up over the previous year and continued in 2015 to sharply increase by 49.3 percent up to 37.94 million tons (See Figure 3). The Chinese authorities persuaded users in the country to consume domestically produced corn by banning imports of unauthorized GMO corns. However, the lower import tariffs levied on corn substitutes became counterproductive, which induced the domestic users on the contrary to select their feed ingredients from among more wide-ranged substitutes in the international market, resulting in an abrupt increase in imports of the corn substitutes. China's total imports of feed grains, including 4.73 million tons of corn, further rose to 42.67 million tons in 2015, which made China be a huge importer of as much as 124.41 million tons of grains in the same year, including soybean imports of 81.74 million tons.

Under such conditions with protective tariffs being set at lower levels, China's price support policy, which raised the domestic price of corn, has produced an unexpected result that the policy itself played another role of encouraging imports of its substitutes.

Figure 3 China's imports of corn and its substitutes



SOURCES: Compiled from United Nations Comtrade Database.

1.3 Mounting inventory of the government

Most of corn produced in China remained unsold in the domestic market due to above-mentioned sharp increases in imports of the corn substitutes. When the unsold corn was continuously piling up as government's reserves in 2016, Chinese media began to frequently send the information, saying "Government's inventory of corn has reached to

the highest level of 220-250 million tons", which made the market people grow their anxiety. If these figures were rightly reported, it is estimated that an unprecedentedly huge amount of the inventories, that other countries had not yet reserved on the globe, was mounting in China. The Chinese surplus of corn was almost equivalent to more than the twice of world stocks excluding that of China.

Since the government's support price for corn producers came to constantly exceed the market price in fiscal 2012, farmers began to sell most of their products to governmental agencies at a profitable level of the support price. Purchases by the government at the support price continued to dramatically grow every year; 30.83 million tons in fiscal 2012, 69.19 million tons in fiscal 2013, 82.79 million tons in fiscal 2014, and 100 million tons in fiscal 2015. These procurements of the government totaled 282.81 million tons in the four years, most of which the Chinese government had to keep as their unsold overstocks.

In this way, the government purchased most of corn being distributed in the markets, which has also brought about another result that private companies engaged in distribution and processing of grains were excluded from the purchase markets in the country. In other words, the procurement by the government has produced a result in China, completely contrary to the goal of its 2004 reform program for marketization of grain distribution aiming at "diversification of distribution channels and development of food processing manufacturers".

1.4 Price support policy stalemated by low tariff rates

China's import tariff rates, which its government agreed to substantially cut according to the WTO Agreement on Agriculture in 2001 as mentioned above, has collapsed its price support policy for corn producers only in a period of seven years since the policy was put into practice in 2007. When negotiators of the Chinese government joined the accession talks with WTO officials, any of them supposedly did not expect that Chinese boarder measures of tariffs would be broken through by surging tides of grain imports in such a short period of time.

Implementation of the price support policy for several years in China demonstrated that it is a highly effective policy for income distribution as well as increases in food production in such countries as staying at a development stage with an economic balance between agriculture and non-agricultural sectors being not yet attained. A history of similar effects can be traced back to European Union's farm policy that had continuously carried out its price support program at a significantly high level for more than 30 years.

With a view to establishing its own food-sufficiency system, the then EEC (European Economic Community) introduced the "Common Agricultural Policy (CAP)" in 1962, implementing price support programs as its core system in the region. Support prices for agricultural commodities were fixed at high levels, almost near to the highest market prices in the region, which brought about not only a rise in producer's income, but also an across-the-board increase in production of agriculture and livestock industries.

As a result, EU faced a difficult problem of oversupplies of farm products for many years. Before the Uruguay Round (1986-1994) or multilateral trade negotiations sponsored by GATT (General Agreement on Tariffs and Trade), however, agriculture had not been listed in the main agendas of GATT talks. This also made it possible for EEC to continuously protect its farm market by blocking inflows of foreign agricultural products with "non-tariff measures" called "variable import levies", which effectively performed the same function as variable tariffs. In addition to this, EU could sell its surplus farm products to

dispose of those products with export subsidies on the world market (Note 2).

In stark contrast to such EU, the Chinese government not only committed to remove non-tariff measures and considerably lower its tariff rates, but also was banned from using export subsidies under the WTO Agreement on Agriculture. In these conditions, therefore, a greatly opened domestic market of China has been widely dominated by imported farm products, far from exporting its surplus of agricultural commodities to overseas markets.

EU found it difficult to sustain its price support policy when it reached a stage of requiring a huge amount of export subsidies to dispose of its surplus reserves mounted in many years. In 1992, EU had to resolutely carry out drastic CAP reforms by "lowering levels of price support" for producers as well as by introducing "direct payments coupled with set-aside". These were so-called "MacSharry reforms". A story of the reforms make us recall that EU could maintain the high-level price support policy as long as 30 years from 1962 to 1992 (Note 3).

On the other hand, China, where per-capita GDP is small and a large income gap between agriculture and industry has not yet been narrowed, is still staying at a stage of development on which a price support policy linked with income transfer can demonstrate its effects. However, China was forced to change the price support policy only in seven years since it was put into practice. This is because China's low tariff rates and other boarder measures committed by itself at its accession to WTO have made it difficult for China to meet preconditions in 2014 that domestic prices do not exceed import prices so as to effectively implement the price support policy. The Chinese government sat down at the table of international economy much later than EU, and could be provided only with a very small portion of the benefits. Both of farmers and financial authorities of China have been compelled to pay the price.

(Note 2) EU's exports of its surplus farm products led to an outbreak of "U.S.-EU wheat export war" in 1980s, meaning a scramble for the farm export markets.

(Note 3) Although EU lowered support price levels in 1992, it is still possible for EU to maintain its support price policy.

2. Experiences of pilot "target price systems" for soybean and cotton producers

2.1 Search for "target price system"

China began taking steps to reform its price support policy in 2014 (Ruan 2015). As mentioned before, corn was the most controversial commodity. This is because the number of corn producers, amounts of its supplies and demands, and financial funds required for reforming its price support policy were all massive. Since its policy change has an enormous impact on the society, any kinds of failure could not be ever acceptable.

On the basis of a philosophy of progressive changes, therefore, Chinese authorities launched a pilot project to shift its price support policy for soybean and cotton into target price systems only at major producing provinces in 2014, supplies of which commodities were limited in the country and had been already supplemented with increased imports. Under the previous policy program, "prices were recovered and lifted by government's purchases at support prices in the market". On the contrary, the new pilot program was greatly switched to the target price system, introducing direct payments to be paid to producers in order to "compensate farmers for the difference between a target price fixed by the government in advance and a lower price in the actual market, while the

government leaves transactions and price decisions of the commodities to the discretion of the market". The target prices of soybean and cotton were respectively fixed at such a level as covered a national average production cost and ensured a certain amount of profits for farmers as well. This system can be regarded as an income support policy of a deficient payment-type program applied in the United States and other countries.

The Chinese government chose to introduce the target price system, because the U.S. has been implementing this farm program for more than 40 years to demonstrate that it is possible to concurrently achieve both targets of "stabilizing farmer's income" as well as "maintaining production by improving price competitiveness", even though protective measures of import tariffs for agricultural commodities are kept at lower levels. In other words, this is because it was indispensable for the most heavily populated China to keep higher self-sufficiency of major agricultural products, when it discontinued the price support policy. It was vital for China to maintain the amount of agricultural production itself.

On the other hand, China continued to carry out the price support policy for corn until fiscal 2015. The level of the support price, which had been raised almost every year until fiscal 2013, remained the same in fiscal 2014 and was lowered in fiscal 2015 by 10.7 percent over the previous year. The continuous rise in government's purchase price since 2008 ceased. Corn producers were not compensated for the decline of the support price in 2015. This was a clear message sent by the Chinese authorities to farmers and market people that the Central Government planned not only to discourage farmers from increasing their production of corn, but also to find a way out from the previous farm policy aiming at improving farmers' incomes by raising the support price.

2.2 Suggestive findings from implementation of pilot target price systems

Three fiscal years from 2014 to 2016 were devoted to implementation of the pilot target price systems for soybean and cotton. As far as cotton is concerned, the pilot target price system achieved its expected results in the first year, including a steep decline in the market price, a return of Chinese users' demands to domestically produced cotton, and a decrease in cotton imports. In the second year 2015, an eligibility criteria for the direct payment was changed from production acreage to quantity of sales, which reduced administrative costs of on-the-spot surveys and confirmation of seeding acreages for respective cotton producers. After completing a successful implementation of the pilot system in these three years, China's 2017 Policy Document No.1 (guidance goals for the upcoming year on agricultural policy) announced in February 2017 revealed that the pilot target price system for cotton producers should be formally changed to a target price system in fiscal 2017.

However, the target price system for cotton producers, which appeared to be successfully carried out, contained an unstable factor as well. This is because the system would be also likely to meet the limitations of WTO's Agreement on Agriculture strictly imposing a ceiling on domestic subsidies for agriculture in addition to above-mentioned low tariff rates.

WTO rules on agriculture were worked out under the leadership of developed countries. They adopted an outlay result-oriented principle to evaluate production-incentive agricultural subsidies, so-called "amber box" support measures that had been respectively taken by WTO's original members of developed countries. This principle was disadvantageous to China, because it did not have any results of budgetary outlays for

production-incentive support measures. China had not provided its farmers with such subsidies before it became a member of WTO. In contrast with developed countries, which had absorbed themselves in offering a substantial amount of subsidies to agriculture, the maximum limit placed on China's domestic farm supports under the WTO rules was fixed only within a range of so-called a "de minimis" level (minimum support level) that is to be exempt from inclusion in the calculations of production-distorting support to be cut with the aggregate measurement of support (AMS). Moreover, China's de minimis ceilings of the aggregate value of the product-specific domestic support and that of non-product-specific domestic support were both fixed, not at 10 percent of the total value of agricultural production which threshold is generally applied to developing countries, but at 8.5 percent, midway between the 10-percent threshold and the 5-percent one applied to developed countries. Developed countries such as Japan, EU members and the U.S. had respectively provided heavy subsidies to farmers for many years before WTO was established, and their domestic subsidies were legalized as past performance under the WTO rules agreed by those countries. Moreover, they have been granted with benefits of the de minimis rule as well. In comparison with these vested interests of the developed countries, it was obviously harsh for China that the ceiling of production-incentive subsidies for domestic agricultural support was fixed at a very low level, while a huge number of small farmers in China need to be provided with support measures which are still essential to them.

Like the price support policy, government's outlays for the pilot target price systems for soybean and cotton, which began in 2014, are to be counted in the de minimis. Deficiency payments paid for cotton producers in 2014 reached to as twice as the maximum limit of the de minimis. If a similar target price system is put into practice for corn producers, the outlay of the government is likely to considerably exceed the de minimis's threshold of 8.5 percent in the first year as the target price system for cotton producers did.

In the WTO Agreement on Agriculture, meanwhile, there is so-called a "blue box" policy of product-specific domestic support, which is not subject to reduction commitments for the time being. Among the direct payments paid under production limiting programs, the "blue box" covers (i) direct payments based on fixed and unchanging areas and yields, or (ii) direct payments made on 85 percent or less of the base level of production.

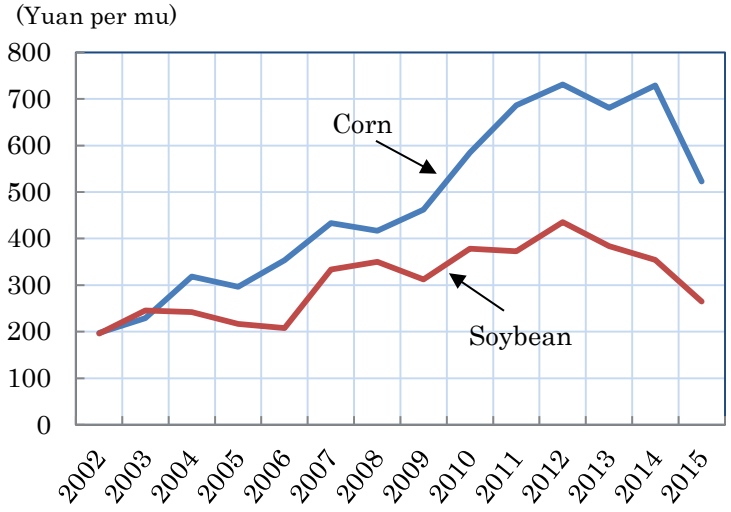
Under these conditions, Chinese authorities modified a part of the target price system for cotton producers, implementation of which system was formally decided on March 16, 2017 by the Chinese administration body called State Council, in such a way as "the amount of production eligible for the income compensation program shall not be more than 85 percent of the national average yearly output (past performance) achieved during the base period from 2012 to 2014". We will be able to suppose that the Chinese authorities are aiming at implementing the cotton target price system in the framework of the WTO's "blue box" policy (Note 4).

On the other hand, a soybean target price was fixed in the first year of the program (2014) at a 4.3 percent higher level than that in the previous year, aiming at increasing its production. However, the higher target price did not achieve any expected results. In the Jilin province, for instance, soybean's seeding acreage declined in 2015 by as much as 24.4 percent over the previous year. The biggest factor responsible for the decline was that profitability of soybean production was far less than that of corn production.

In this context, let us compare the profitability of soybean production with that of corn production in a national average (See Figure 4). Soybean producer's average profits were estimated to be 354 yuan per mu (1 hectare = 15 mu) in fiscal 2014. Even though 61 yuan per mu, a unit of the deficiency payment fixed for soybean producers in Heilongjiang province at the highest level in the country, is added to the average profits, the total profits

do not reach to 60 percent of the national average profits of corn producers, 729 yuan per mu. In China, the major producing areas of soybean and corn coincide with each other at the three provinces and one region, where farmers can grow only one crop in a year due to climate conditions. Under the above-mentioned profit structure of agriculture, more farmers naturally preferred to grow corn on their farmlands. In other words, soybean planting acreage fluctuates depending upon the relative profitability to be expected from corn production. The Central Government has clearly learned that it should consider the production policies of soybean and corn in an integrated way.

Figure 4 Comparison of production profits between corn and soybean in China



SOURCES: Compiled from "National Compilation of Data on Costs and Profits of Agricultural Products" (2003 to 2016 editions).

At the same time, the government has also found out that the administrative costs for the soybean target price system, including expenses of on-the-spot surveys and confirmation of seeding acreages, remittance of deficiency payments and others, became a bigger burden than expected, because a huge number of small producers of soybean participated in the system. The number of corn producers and its seeding acreages are both several times larger than those of soybean, which will certainly force the government to spend a more enormous amount of administrative costs of acreage confirmation and others for the corn target price system. The Chinese authorities have also learned that they would need to find out a more rational way of implementing the policy for corn producers.

(Note 4) "The notice about details on cotton target price reform" jointly issued by the National Development and Reform Commission and Ministry of Finance of the People's Republic of China on March 16, 2017.

3. Corn policy shifting into "producer compensation system"

3.1 Discontinued price support policy for corn producers

China made a decision to reform its corn price support policy in 2016 on the basis of above-mentioned experiences of pilot target price systems for soybean and cotton. Government's procurements of corn at the support price in the market were abolished, leaving purchases and price formations to discretion of the market. Instead, the Chinese authorities took steps to search for a "producer compensation system", not like "target price systems" applied to soybean and cotton producers.

The Central Government had worked out concrete measures to implement the pilot target price systems for soybean and cotton. When the government established the corn producer compensation system, however, it got involved only in preparations for the policy direction and a total budget to be outlaid for producer compensation. The Chinese authorities made a choice to grant appropriate autonomy to local governments of provinces and regions so that they could respectively make concrete programs for implementing their own systems, details of which will be mentioned later.

This is because China has a huge number of corn producers and massive planting acreage with a long value chain of corn processing manufacturers such as livestock and cornstarch industries in the country. Furthermore, the corn policy change was expected to have various kinds of impact on wide-ranged parts of the Chinese society. In the background of the above-mentioned policy decision made by the Central Government, there seemed to be a way of thinking that the government would find out the best way of implementing the corn policy from among corn programs to be carried out by local governments of the three provinces and one region achieving the most favorable results at their respective grass-root levels.

Moreover, corn acreage in Heilongjiang province, which is generally less estimated in the statistics of the National Bureau of Statistics of China, has grown to 5.82 million hectare in 2015, which is larger by some 40 percent than Japan's total acreage of farm crops, 4.15 million hectares, in 2014. Corn acreages in Jilin province and Inner Mongolia region are respectively equivalent to almost 80 to 90 percent of that in the Heilongjiang province. The acreage in Liaoning province has also increased to more than half of that in the same province. Each of these three provinces and one region has an extensive planting acreage of corn, that is, in a sense, comparable to a total acreage of farm crops in one country. As will be explained in Note 5, furthermore, the Central Government was expected to possibly take a longer time to adjust a big difference of the acreage statistics between the National Bureau of Statistics of China and the Provincial Bureau of Statistics of Heilongjiang. It was definitely a realistic and wise judgment for the Chinese authorities to provide local governments with the autonomy in seeking for the best way to make direct payments for corn producers in respective provinces and the region.

The information announced by the Central Government regarding the reform to be carried forward on the corn price support policy is outlined as follows:

China's annual agricultural policy goals, so-called "No. 1 Document" issued on January 27, 2016, clarified its policy direction to be pursued in reforming the corn price support system, saying "We should carry forward the reform of the corn procurement system on such principles as leaving price formation to the market as well as separating a part of producer compensation included in the support price. We will build up a corn producer compensation system with comprehensive consideration of various aspects such as farmer's reasonable profits, solvency of financial authorities, and harmonized development of corn processing manufacturers' chain, by concurrently reflecting demand and supply of

corn into its market price". Through this Document, the Chinese authorities announced their clear message that they would provide corn producers with direct payments, but not implement a corn target price system similar to the pilot target price systems for soybean and cotton producers.

3.2 Corn producer compensation system aiming at being implemented in WTO's framework of "blue box" policy

Following the "No. 1 Document" issued on January 27, 2016, a press conference was held on March 28, 2016 jointly by the National Development and Reform Commission, Central Rural Work Leading Group of the Chinese Communist Party, Ministry of Finance, Ministry of Agriculture, State Administration of Grain, and Agricultural Bank of China. At the press conference, they made an additional notice on the corn producer compensation system, announcing that the corn price support policy, which had been carried out in the three provinces and one region since fiscal 2007, was abolished in fiscal 2016 and would be replaced by the corn producer compensation system to be built up to "ensure reasonable profits for producers".

On June 20, 2016, moreover, the Ministry of Finance revealed information on its website that the Ministry announced its guideline on implementation of the corn producer compensation system. Although details on the guideline were not disclosed, the Ministry gave an outline of the compensation system by quoting an article of the "China Financial & Economic News", reporting "Financial Ministry of the Central Government highly supports the reform of the grain procurement and temporary reserve system". According to the quoted article, the Central Government is to adopt the same standard for producer compensation per unit of acreage in the three provinces and one region, which standard will be decided every year by the Central Government. Acreages to be targeted for direct payment in the three provinces and one region are to be respectively fixed for a period of several years on the basis of past achievements (planting acreage and production in 2014).

By considering the information revealed by China's Ministry of Finance, we can suppose that the corn producer compensation system has been designed to aim at being implemented as a "blue box" policy of the WTO Agreement on Agriculture. As discussed earlier, (i) direct payments based on fixed and unchanging areas and yields, or (ii) direct payments made on 85 percent or less of a fixed and unchanging base level of production, both of which are to be paid under production limiting programs, are classified as "blue box" policies. A large-scale reduction of the corn planting acreage was a prerequisite for the above-mentioned policy shift into the corn producer compensation system. Therefore, the government planned to reduce the corn planting acreage in the country at least by 10 percent or 3.33 million hectares (50 million mu) in comparison with that in 2014 by the year of 2020, out of which more than 2 million hectares were to be targeted for the reduction at cold-climate areas in North East provinces as well as desertification-vulnerable areas in the northern dry region (Ministry of Agriculture of China 2015). At the same time, corn producers are required not only to change their cropping system from continuous planting of corn to crop rotation of corn, soybean and others, but also to increase corn planting acreages for "green-corn" silage up to 1.67 million hectares or 25 million mu by 2020 (Ministry of Agriculture of China 2016).

As mentioned above, the targets for direct payments are fixed on the basis of achievements of the production acreage and the amount of production in 2014. Areas eligible for the direct payment are limited to the three provinces and one region,

accounting for about 45 percent of the national total production. The corn production in these provinces and the region is far less than 85 percent of the total production achieved during the past years in the country, which meets the conditions of WTO's rules on the blue box, indicating "direct payment that is made on the standard of 85 percent or less of the base level of production".

3.3 Outline of corn producer compensation system

(a) Direct payment by Central Government

China's Ministry of Finance allocated funds of more than 30 billion yuan for corn producer compensation (direct payment) to the three provinces and one region on August 9, 2016 before producers completed harvesting of corn, and made an additional allocation of 9 billion yuan on October 28 in the same year. The total payment came to 39 billion yuan (about 624 billion yen), out of which 14.9 billion yuan was provided to Heilongjiang province, followed by 9.5 billion yuan to Jilin province, 8.7 billion yuan to Inner Mongolia region, and 6.0 billion yuan to Liaoning province (See Table 2). These payments hit a record high of the governmental single-crop subsidy in the history of China's agricultural policy.

Table 2 Corn production at the three provinces and one region in North East China and outlays for producer compensation paid by China's Ministry of Finance

Provinces	Production acreage in 2014 (a)	Production in 2014 (b)	Yield (b/a)	Compensation paid by Ministry of Finance of Central Gov. in 2016 (c)	Unit of payment (c/a)	Unit of payment (c/a/15)	Unit of payment (c/b)
	1000 hectares	1000 tons	Tons per hectare	Billion yuan	Yuan per hectare	Yuan per mu	Yuan per ton
Inner Mongolia Auto. Reg.	3,372	21,861	6.48	8.7	2,571	171	397
Liaoning Prov.	2,330	11,705	5.02	6.0	2,571	171	512
Jilin Prov.	3,697	27,335	7.39	9.5	2,571	171	348
Heilongjiang Prov.	5,784	33,434	5.78	14.9	2,571	171	445
Total or average of three provinces & one region	15,183	94,335	6.21	39.0	2,571	171	414
National total or average	37,123	215,646	5.81	—	—	—	—

SOURCE: Compiled from "China Rural Statistical Yearbook" (2015 edition) and reference materials of this paper.
(Note) 1 hectare = 15 mu

The unit of payment per acreage is reportedly set up at the same level for the three provinces and one region. If the above-mentioned outlay by China's Ministry of Finance is divided by respective production acreages in the three provinces and one region, the units

of payment in the two provinces and one region (Jilin, Liaoning and Inner Mongolia), except Heilongjiang province, all come to 171 yuan per mu. If the Central Government's allocation of corn producer compensation to Heilongjiang province is divided by this unit of payment of 171 yuan per mu, the corn planting acreage at the province in 2014 reaches to 5.78 million hectares, which is 6.3 percent larger than 5.44 million hectares announced by the National Bureau of Statistics of China as the corn planting acreage of the province in the same year (Note 5).

With regard to concrete arrangements for the direct payment, local governments of the three provinces and one region are allowed to make their own decisions on targeted areas, eligible producers, payment standards and the like on the basis of their own conditions in the respective three provinces and the region. The Central Government has also authorized these local governments not only to provide priority allocations of direct payments to major producing areas as well as competitive advantaged areas, but also to use 10 percent of the Central Government's subsidy for the corn production adjustment programs. The fund for the production adjustment programs can be invested in various schemes for promoting production shifts from corn to other crops, consolidation of infrastructure such as distribution and storage facilities of corn, and development of livestock and corn processing industries. In the following paragraphs, characteristic features of compensation payments made by respective local governments of the three provinces and one region will be outlined.

(Note 5) According to the Statistics Bureau of Heilongjiang Province, the corn planting acreage in the province was approximately 7.19 million hectares in 2013. It is as much as 32.1 percent larger than the acreage of 5.44 million hectares, which was recorded as the Heilongjiang Province's acreage in the 2014 statistics by the National Bureau of Statistics of China. This is because the planting acreage increased thanks to improved profitability of corn production by continuous hikes of government's support price particularly since 2008. It can be presumed that the Central Government raised the targeted acreage up to 5.78 million hectares when it determined the amount of allocation to the Heilongjiang province probably by taking into consideration a part of the above-mentioned difference in the planting acreages.

(b) Unified payment standard in Heilongjiang province

The most characteristic feature of the payment method in Heilongjiang province lies in a unified unit of payment applied by the provincial government throughout the province. The corn acreage to be targeted for the direct payment was decided at 6.44 million hectares (Note 6) in 2016 by the provincial government of Heilongjiang, excluding farmlands that were shifted in production from corn to soybean, millet, forage and other crops in the same year.

As explained above in Note 5, the acreage targeted for the payment in Heilongjiang province exceeded the statistical acreage authorized by the National Bureau of Statistics, and also included environmentally sensitive farmlands that were scheduled to quit corn production by 2020. Until shifting of crops or set-aside is completed on these farmlands, producers cultivating the farmlands will continuously have to depend upon the corn production. Therefore, the provincial government decided to ensure a transitional measure by providing direct payments also to those farmers producing corn on such farmlands.

If the fund of 14.9 billion yuan paid by the Central Government to Heilongjiang province is divided by this targeted acreage of 6.44 million hectares, a unit of payment comes to 154 yuan per mu, about 10 percent less than the unit of payment of 171 yuan per mu that was the basis of the subsidy allocated by China's Ministry of Finance. In the province of

Heilongjiang, the unified unit of payment is being adopted regardless of how much respective corn farmlands yielded in past years.

(Note 6) Economic Daily (December 19, 2016, Beijing), "How is farmer's loss in corn production compensated: a series reporting the reforms of corn purchasing and stockpiling systems".

(c) Funds of direct payments allocated with priority to major producing areas in other provinces and region

In contrast to the unified unit of payment applied in Heilongjiang province, all of Inner Mongolia region, Jilin province and Liaoning province have adopted a different way of fixing the unit of payment by putting more weight on past achievements of planting acreages and productions (in 2014) at municipalities and counties in respective administrative divisions (Administrative hierarchy in China: province → municipality → county). In Inner Mongolia region and Jilin province, acreage and production were both given respective 50 percent of weight to fix the direct payment, while in Liaoning province 60 percent of weight was put on acreage and 40 percent on production. Statistical data on acreage and production in 2014 announced by the National Bureau of Statistics were used in these two provinces and one region. The government of Liaoning province, however, only made use of National Bureau's average data on production during the period from 2012 to 2014. Governments of these provinces and the region all plan to maintain this payment method for three years from 2016 to 2018. In the two provinces and one region, the unit of payment for producer compensation was finally determined at each county. Namely, the direct payment was paid to corn producers on the basis of unified unit of payment at respective counties.

Such payment method makes it possible for governments of these two provinces and one region to allocate the fund of direct payments with priority to counties achieving better yields of corn by applying a higher unit of payment for producers in these counties. For instance, a unit of payment of 161 yuan per mu was applied to Yushu county, the largest corn producing area in Jilin province, which is higher than that in Heilongjiang province (See above Note 5). An average unit of payment at counties in Jilin province, however, is 158 yuan per mu (Note 7), close to the unified unit of payment of 154 yuan per mu in Heilongjiang province. Both of units of payment in Liaoning province and Inner Mongolia region are averagely fixed at a level similar to that in Heilongjiang province according to various press reports (Note 8).

(Note 7) The average unit of payment per mu in Jilin province is estimated on the basis of an average unit of payment per ton of 320 yuan in 2016 and an average corn yield per mu of 493 kg in 2014. (Website of Government of Jilin Province, "Yang Guang, Deputy Director of Jilin Province's Food Bureau, makes a report on the situation of grain purchasing activities in the province", January 18, 2017).

(Note 8) Payment of corn producer compensation is to be completed before harvesting by September 30 in the current year (by October 31 only in the first year of 2016). After the payment is completed, every county administration is required to reveal an official notice of village-wise information on direct payments, including names of beneficiary producers, targeted acreage, payment standard, date of payment completion and others, in a period of more than seven days. This suggests that the Central Government is taking a strong attitude toward transparency of policy implementation.

3.4 Direct payment with deficiency payment-style elements being taken into account

As mentioned earlier, the Central Government decided on its own initiative to allocate the fund of direct payment for corn producers, 39 billion yuan, to the three provinces and one region before farmers completed harvesting. The grounds for this decision have not yet been disclosed. In the policy implementation of the direct payment, however, we will be able to find a way of approach which is almost similar to that of the pilot target price system for soybean producers because the government expressed its comments on the decision by saying "Producers shall be compensated with a reasonable level of profits". The outline of the corn producer compensation system can be presumed in the following way:

In order to make an accurate presumption of the system, we will need data on a target price as well as a market price. In this context, let us deem the government's support price of 2,000 yuan per ton in 2015 as the corn target price. Although this corn support price is 10.7 percent lower than the government's support price of 2,240 yuan per ton in 2014, it covers almost 90 percent of a total amount of the national average production costs and family members' wages in 2015. From the Chinese authorities' view point of protecting farmer's basic profits while controlling the production, it will be reasonable to regard the corn support price in 2015 as the target price.

Let us deem an import price as a market price. The market price of corn had been continuously exceeding the import price since 2013. This was caused by the government's support price higher than the import price. In 2016, however, the domestic market price was expected to decline close to the import price, as government's procurement at a higher support price was abolished. The import price was actually fluctuating between 1,500 and 1,700 yuan during the years of 2015 and 2016.

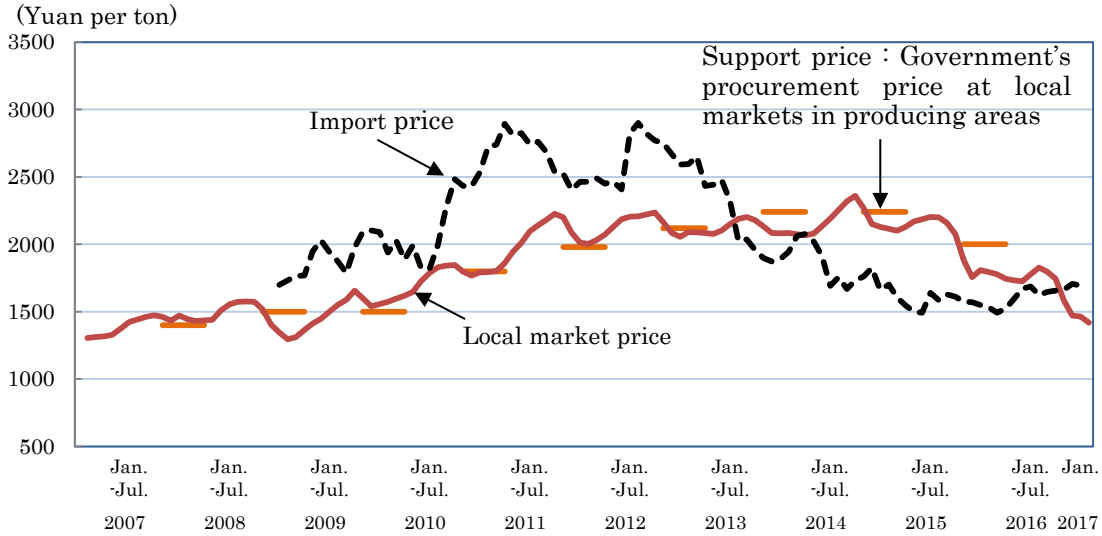
On the other hand, China's Ministry of Finance outlaid 39 billion yuan on the direct payments for the corn producers. If this figure of expenditure is divided by 94.34 million tons of 2014 corn production in the three provinces and one region, which is authorized by the National Bureau of Statistics, it makes an average direct payment of 414 yuan per ton. If this unit of payment for producers, 414 yuan per ton, is subtracted from government's support price in 2015 of 2,000 yuan per ton which is here regarded as the target price, the difference of 1,586 yuan per ton will be a market price, reaching to a level almost similar to the above-mentioned import prices in 2015 and 2016. Namely, the outlay of the Ministry of Finance was prepared with a calculation format paying a direct payment of 414 yuan per ton to producers, which is the difference between the governmental support price of 2,000 yuan per ton, deemed as the target price, and the above-mentioned market price of 1,586 yuan per ton (See Figure 6). In other words, the Central Government seemed to take budgetary steps by determining the unit of payment on the assumption that the corn market price would fall down to around 1,600 yuan per ton of the import price in 2015 if the price support policy was discontinued.

In the cases of pilot deficiency payment programs for soybean and cotton producers, however, producers of these two crops were ensured to be compensated for the differences between target prices and market prices after they shipped their products to the market. They were not obliged to meet the market risk without regard to how far the market price declined. Under the direct payment system for corn producers, meanwhile, a certain amount of compensation determined by the government in advance before harvesting is to be paid to producers. In the EU's common agricultural policy, on the contrary, a low-leveled price support system has been maintained, even after "MacShary Reform" was carried out

to considerably decline the support level. In contrast to such EU' farm policy, the Chinese authorities made a reform of their corn policy by introducing only a new producer compensation system after perfectly abolishing the price support policy. Under China's new policy for corn producers, producers have been provided with a policy framework in which they are required to meet the risk of a market price decline when the price goes down beyond the level of government's expectation. What producers of corn had to bear in the 2016 market was actually a risk of the price fall.

According to the announcement made by the National Development and Reform Commission, an average corn market price of local market had already fallen to 1,470 yuan per ton in producing areas by the end of November 2016 when the 2016 harvesting season of corn started (See Figure 5). The government purchase price continued to decline month by month down to 1,392 yuan per ton in February 2017, 12.3 percent lower than the deemed market price that was calculated as above at 1,586 yuan per ton. This tells us that the government's compensation program for corn producers made up only about 70 percent of the difference between the deemed target price of 2,000 yuan per ton and the actual marketing price, not 100 percent of the difference, in fiscal 2016 (See Figure 6). Therefore, it will be more reasonable for us to recognize China's compensation system for corn producers not as a full-fledged deficiency payment program, but as a direct payment system with deficiency payment-style elements being placed as a pillar of its systematic framework.

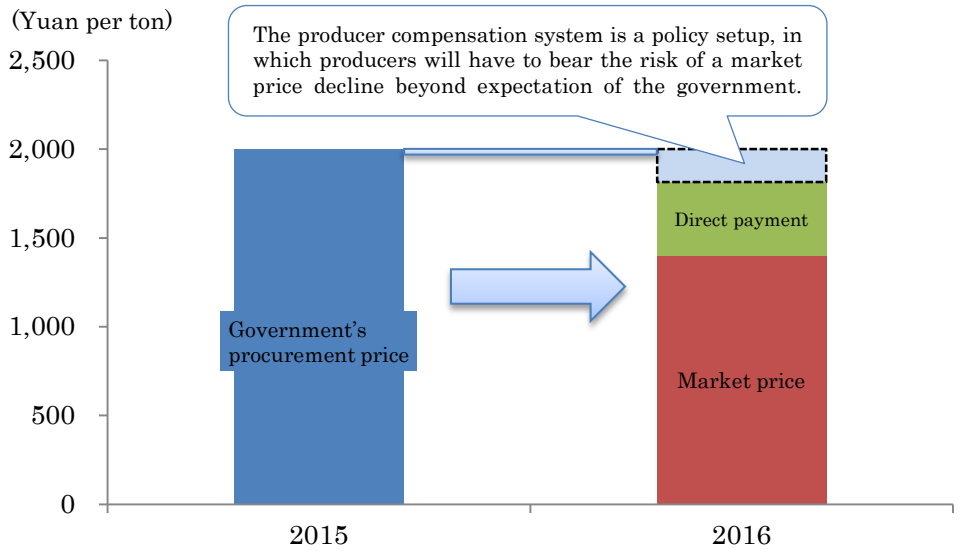
Figure 5 Relationship between support price of corn and its market price in China



SOURCE: Compiled from information materials of National Development and Reform Commission, China Customs Statistics, and Wind Information Co., Ltd.

(Note) The corn support price was named as the temporary procurement-reserve price in China. Procurements by the government at the support price were carried out from late November in the current year to the end of April in the following year. The procurement program was replaced by the corn producer compensation system in fiscal 2016.

Figure 6 Illustration of China's corn price support policy shifting to production compensation system in 2016



SOURCES: Prepared by the author.

3.5 Elimination of disparity between profitability of corn and soybean

Let us make another estimate on what kind of influence above-mentioned actual levels of the unit of direct payment and the market price gave on corn producer's profits as well as on existing disparity between profitability of corn and soybean. The result of the rough estimate shows that an average profit of corn production in the three provinces and one region covered not only 100 percent of direct production costs (Note 9), but also some 75 percent of family members' wages in 2016, although the profit was reduced almost 40 percent less than the national average in 2015. On the other hand, the amount of direct payments paid for soybean producers rose in 2015, leading to elimination of a gap between the profits of corn and soybean that had collapsed a rotation system of these two crops.

Furthermore, let us make an estimate of corn producer's revenue per mu in 2016. As above-mentioned, an actual unit of direct payment in the three provinces and one region is estimated at a level almost similar to Heilongjiang province's unit of 154 yuan per mu, less than that of the Central Government, 171 yuan per mu. In this estimate, therefore, we will regard 154 yuan per mu as an average unit of payment in these provinces and the region.

If farmer's marketing price is deemed as 1,400 yuan per ton (1.4 yuan per kg) and is multiplied by an average yield of 414 kg per mu in the three provinces and one region, it makes an average sales amount of 580 yuan per mu. If the unit of direct payment of 154 yuan per mu is added to the average sales, it also makes producer's average revenue of 734 yuan per mu.

Next, let us make an estimate on profitability of corn production in 2016 by supposing that national average figures on corn production costs, family members' wages, and farmland rent in 2015 are all deemed as figures of the three provinces and one region in 2016 (See Table 3). The above-mentioned 734 yuan per mu minus average production costs of 427 yuan mu makes producer's profits of 307 yuan per mu, which cover 68.7 percent of family members' wages of 447 yuan per mu in 2015. If the farmland rent is excluded from the production costs, it covers 75.1 percent of the family members' wages (See Figure 7). In other words, we can understand that corn producer's profits of 307 yuan per mu in the three provinces and one region not only covered all of the corn production costs, but also ensured a reasonable income to corn producers, although their profits were lowered about 40 percent less than a national average of corn producer's profits of 523 yuan per mu in 2015.

Table 3 Production costs and profits of corn and soybean in China (national average)

(Unit: Yuan per mu)

	Corn					Soybean				
	2008	2010	2012	2014	2015	2008	2010	2012	2014	2015
Revenue (Sales)	683	872	1,122	1,146	950	526	586	707	642	560
Production costs	266	288	391	417	427	176	208	271	288	295
Production inputs and outsourcings of farm works	243	261	345	365	376	154	165	205	203	202
Rent paid for farmlands	8	13	18	24	29	14	28	46	65	73
Wages for employees	14	15	28	28	22	9	15	21	20	19
Profits	417	584	731	729	523	350	378	435	354	265
Opportunity cost for family labors	163	220	370	446	447	79	101	157	197	196
Opportunity cost for own-lands	95	124	163	200	210	92	123	150	183	184
Net profit	159	240	198	82	△134	178	155	129	△26	△115

SOURCES: "National Compilation of Data on Costs and Profits of Agricultural Products" (See Figure 4).

(Note) Production costs include only direct expenses paid for production inputs, rented farm lands, employees and others.

Without the government's direct payment, however, producer's profits will be estimated at 153 yuan per mu by subtracting the production costs of 427 yuan per mu from the average sales of 580 yuan per mu. These estimated profits are only 34.3 percent of family members' wages of 447 yuan. Under such conditions, therefore, we can suppose that corn has become a low-margin crop in provinces other than the three provinces and one region, in which corn producers are not eligible to receive direct payments, although the corn production has not yet fallen into the red.

While the profitability of corn production is beginning to shrink, on the other hand, profitability of soybean production in fiscal 2015 remarkably improved as will be seen below. This has eliminated the disparity between the profitability of these two crops. China's Ministry of Finance outlaid 6 billion yuan in total for the target price system of soybean in fiscal 2015 due to a decline in its market price. The outlay tremendously

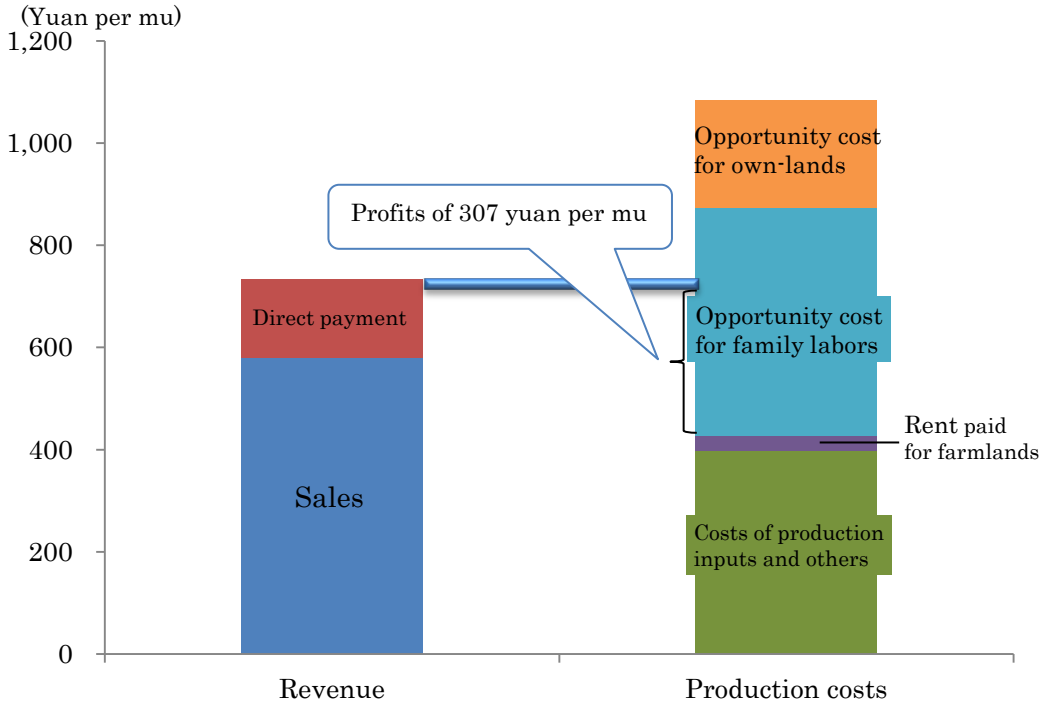
increased from some 3.3 billion yuan in fiscal 2014 when the system started, which raised the payment unit of the target price system that much higher as well. In Heilongjiang province, the largest soybean producing area in China, for instance, the unit of payment rose to 131 yuan per mu, more than twice as much as 61 yuan per mu in the previous year.

Hereinafter, let us compare profitability of soybean production with that of corn production by using data on a national average of soybean production costs, family members' wages, farmland rent, and profits in 2015 as well as the unit of payment for soybean producers in Heilongjiang province.

If the unit of payment of the target price system in Heilongjiang province, 131 yuan per mu, is added to a national average sales of 560 yuan per mu, it makes the revenue of soybean production of 691 yuan per mu. Next, if the production costs of 295 yuan per mu are deducted from this revenue of 691 yuan per mu, it makes soybean producer's profits of 396 yuan per mu. The profits have been fully equivalent to family members' wages and rent on self-cultivated lands. At the same time, they have risen to the level exceeding above-mentioned corn producer's profits of 307 yuan per mu (See Figure 8).

(Note 9) In this paper, production costs include only direct expenses paid for production inputs, rented farmlands, employees and others.

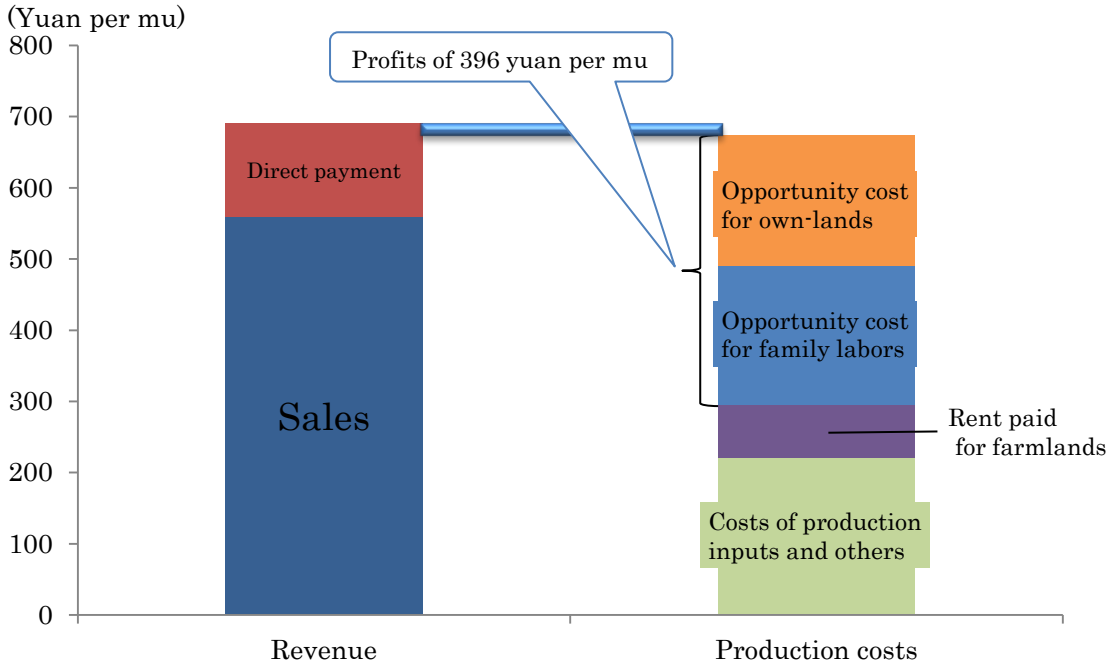
Figure 7 Revenue from corn production compared with its costs in fiscal 2016



SOURCE: Compiled from "National Compilation of Data on Costs and Profits of Agricultural Products" (2016 edition) and others.

(Note) An amount of sales, 580 yuan per mu, was calculated by multiplying a market price of corn in fiscal 2016, deemed at 1,400 yuan per ton (1.4 yuan per kg), by an average yield of 414 kg per mu in the three provinces and one region. Data on the national average of production costs in fiscal 2015 ("National Compilation of Data on Costs and Profits of Agricultural Products", 2016 edition) were cited to show the production costs and profits in Figure 7. The costs of production inputs and others include wages for employees, but exclude rent paid for farmlands.

Figure 8 Revenue from soybean production compared with its costs in fiscal 2015



SOURCE: "National Compilation of Data on Costs and Profits of Agricultural Products" (2016 edition) (See Figure 7).

(Note) The unit of direct payment for soybean producers in Heilongjiang province, 131 yuan per mu, is used as a unit of payment of the direct payment program for soybean producers in the country. All of other data are quoted from "National Compilation of Data on Costs and Profits of Agricultural Products" (2016 edition). Costs of production inputs and others include wages for employees, but exclude rent paid for farmlands.

4. Possible impacts of China's corn producer compensation system on domestic and global markets of grains

Chinese authorities found it difficult to continue the price support policy for corn producers in effective manners and transformed the policy into a direct payment program, named as the producer compensation system, in 2016. In this situation, however, China is likely to strike the wall of WTO again, imposing a cap on domestic agricultural subsidies of member countries with its Agreement on Agriculture. Future policy options left to the Chinese government will be running out except a "blue box" policy or a "green box" policy which does not provide farmers with any incentives to increase their production. This is because 39 billion yuan of direct payments paid for corn producers in 2016 would remarkably exceed the 8.5 percent de minimis limit, if the direct payment system is

regarded as an “amber box” policy. In 2015, the market price of corn rose by nearly 30 percent over the year of 2016 and its total production value increased that much to 431.5 billion yuan. However, China’s outlay of 39 billion yuan paid as the direct payment for corn producers reaches to 9.0 percent of this total production value. Namely, the outlay would override the ceiling of the de minimis even in a year like 2015 when the value of the total production was greatly raised in the market.

Only one year has passed since the new policy of corn producer compensation system was put into practice in 2016. Governments of the three provinces and one region are still searching for the most effective policy program through implementing this new compensation system. Although the system should not be evaluated in a hasty manner, it can be noted here that the following results have been already achieved.

The first result is that an intended objective of reducing both corn’s acreage and production has been attained. The planting acreage of corn in the country declined by 30 million mu or 2 million hectares over the previous year, including reductions of around 19 million mu in Heilongjiang province (Tang 2017) and 6 million mu in Inner Mongolia region (Grain Bureau of Inner Mongolia Autonomous Region 2016). The reduction in the acreage was considerably well above the planned goal of 10 million mu.

As a result, the total production of corn was reduced by 5.08 million tons or 2.3 percent over the previous year, finally putting an end to the increasing trend of grain production in China that continued for twelve straight years since 2004.

The second result is a rapid decrease in imports of corn and other feed grains due to lowered prices in the domestic market in 2016. The price of corn began to sharply decline in the market because the Chinese authorities ceased to prop up the corn in the market by procuring the commodity. It slipped down to less than import prices in October 2016 for the first time in the past three years and two months. Such a market trend continued in the following months, and the corn price in the domestic market fell down to 18.5 percent lower than the import price in February 2017.

This reversal of corn prices in the domestic market and its import prices immediately brought about a sharp reduction of imports of corn and other feed grains. According to statistics of customs, China’s import of corn in 2016 decreased to 3.17 million tons, 33.0 percent less than that in the previous year, followed by great declines of imports of grain sorghum by 37.9 percent to 6.65 million tons and barley by 53.3 percent to 5.01 million tons. Feed manufacturers and livestock industries in the country, which were depending upon cheaper feed grains imported from other countries, have resumed consuming domestic corn as feed materials.

Furthermore, China will theoretically find it possible to grow its potential to export corn, if its domestic price continues to be nearly 20 percent lower than the import price for a certain period of time. Some of the corn users in Japan actually examined the feasibility of importing corn from China in March 2017, when there were increasing concerns in Japan that the United States would run short of its corn supplies to the Japanese manufacturers because of difficulties in river transportation caused by a big freeze in the North American Continent (Note 10).

The third favorable result is revitalization of corn processing industries in China. Most of domestic manufacturers such as processors of corn starch and corn alcohol had brought their factories to a standstill or almost shut down their operation in order to avoid deteriorating their management by using expensive corn produced in China as raw materials. In 2016, however, these manufacturers resumed their operation since the price of corn began to decline in the domestic market.

According to the National Administration of Grain, domestic corporations such as feed

manufacturers and corn processors purchased 72.04 million tons of corn harvested in the three provinces and one region by February 25, 2017, occupying more than 70 percent of corn produced in these provinces and the region in 2016. The biggest buyer of the corn among these corporations was COFCO or China National Cereals, Oils and Foodstuffs Corporation. COFCO, China's largest food processing and manufacturing corporation, purchased 6.85 million tons of corn in the three provinces and one region by the end of 2016, which was equivalent to 17 percent of the total transactions of corn in those provinces and the region (Note 11). Under the previous price support policy, the China Grain Reserves Corporation (SINOGRAIN) had been exclusively entitled to handle the purchases of price-supported commodities. Since the policy for corn producers now changed, COFCO and other corporations have finally been given chances to join the transactions in the market.

Contrary to these effective achievements by the policy change, meanwhile, China is now being confronted with serious challenges such as a decrease in producer's revenue and a huge financial burden laid on the Central Government.

As mentioned above, profits of corn producers paid with governmental direct payments in the three provinces and one region declined in 2016 over the previous year. In addition to that, corn has become a less attractive crop yielding few profits in provinces other than these provinces and the region, comprising more than half of the national total production of corn, because the crop is not targeted by the producer compensation system in those provinces. Under such conditions, it is highly concerned that China's food security maintaining the basic self-sufficiency of feed grains could be jeopardized, if Chinese producers are extremely discouraged to grow corn for years to come.

If the Chinese authorities wish to stabilize its production of corn, they will need to provide corn producers with incentives stimulating their motivation in some manners. However, effective measures to be taken for encouraging the production are very limited under the above-mentioned constrains imposed by the WTO Agreement on Agriculture. What is available to China is only an option to be chosen from among WTO's "green box" policy programs, which will require a larger amount of government spending.

The corn producer compensation system looks more like a "blue box" policy program at the current stage of policy implementation. Under the WTO rules, however, the "blue box" policy has been originally regarded as a policy to be adopted in a transition period aiming at a shift to the "green box" policy. It is assumable that China will seek a possibility to change the current policy into a "green box" policy sooner or later. In the China's 2017 Policy Document No.1, the Central Government has already made an announcement that the soybean target price system would be changed. Through the implementation of the pilot system during the three-year period from 2014 to 2016, criticism against the system itself have been growing, pointing out that administrative costs were too much spent particularly for on-the-spot surveys and confirmation on seeding acreages as well as remittance of deficiency payments to a huge number of small farmers. It can also be presumed that two subsidy systems for corn and soybean producers will be unified into a single program. If the unified policy program is put into practice on the basis of past performances of subsidy payments as well as in a non-product-specific manner, it could be regarded as a "green box" policy.

However, "green box" policies are scarcely effective in promoting production. If China aims at maintaining the production of corn, it will need to provide producers with more subsidies. On the other hand, an era of rapid economic growth is over in China and its growth rate is expected to shrink year after year. China's tax revenue growth will also be certainly sluggish over the coming years. Furthermore, its accumulated financial deficit is

getting near to a warning-stage level. Under these circumstances, it seems doubtful whether the Central Government will be able to further increase the financial outlay for boosting corn production in the country. If China discontinues to secure the budgetary resources, the production of corn could begin to decrease.

As the imports of corn and its alternative grains such as grain sorghum and barley considerably decreased in 2016, the policy change for corn producers in the same year is expected to have a short-time effect in reducing imports of these grains. However, resumption of an increase in corn imports cannot be deniable, if its inventory clearance proceeds to a certain level in a near future. In China, an annual demand for feed grains such as corn has increased to about 200 million tons. Supposing that 20 percent of the demand is replaced by overseas corn, for instance, China's import of corn could hit 40 million tons per year, accounting for as much as more than 30 percent of its transactions in the global market. Although this is a massive amount of corn, quite a few countries including Brazil and Ukraine will be able to increase their supplies of corn to China within a relatively short time, if corn producers in these foreign countries have such future prospects as China will continue importing corn at a reasonable price level in stable manners over a long period of time.

China's imports of soybean, which began in 1996, have currently grown up to more than 80 million tons in a year, yielding huge profits for agriculture in the United States and Brazil. If China continues to carry out the current system for domestic producers, an increase in corn imports will be inevitable in years to come. This will create a great demand in the world agriculture. Of course, China might possibly adopt an alternative scenario that it will increase imports of meats by expanding its low-tariff quota instead of boosting imports of feed grains. China's grain policy is now in a transition period of change and adjustment. Although its policy still remains full of uncertain elements, it is quite certain that the feed grain policy of China will not only provide a new chance to the world agriculture, but also lead the global market of grains to head for an unprecedented stage of business development.

(Note 10) NIKKEI Shimbun (Japan Economics Newspaper written in Japanese), "Japan resumes imports of expensive Chinese corn due to delayed shipment struck by big freeze from the United States?" (March 8, 2017).
(Note 11) Farmers' Daily (February 24, 2017, Beijing), "Yearly review on reform of corn storage and transportation system".

References (written in Chinese except "Akihiko Hirasawa (2015)", "Ruan Wei (2014)" and "Ruan Wei (2015)" written in Japanese).

- Finance Department, Agriculture and Stock Raising Department of Wulanchabu City in Inner Mongolia Autonomous Region (2016), *Establishment of implementation plan of corn producer compensation system,* August 23.
- Grain Department of Inner Mongolia Autonomous Region (2016), *Press conference on reform of corn purchasing and stockpiling system*, November 8.
- Tongliao Municipal People's Government, Inner Mongolia Autonomous Region (2016), *Establishment of implementation plan of corn producer compensation system*, August 19.

- Da'an City People's Government, Jilin Province (2016), *Establishment of implementation plan of corn producer compensation system in Da'an City*, September 14.
- Economic Daily (December 20, 2016), *Report on reform of corn purchasing and stockpiling system: Who will take the burden of the corn procurement?*
- Financial News Network (November 9, 2016), *Development of corn producer compensation··Farmland renting producers are still facing a loss.*
- Huang Jikun, Wang Dan and Hu Jiliang (2015), *Views on implementation of target price policy for agricultural products,* China Rural Economy, May issue
- Mudanjiang Daily (November 1, 2016), *Determination of corn producer compensation standards in Heilongjiang Province.*
- Administration Department of Heilongjiang Provincial People's Government (2016), *Implementation plan of corn producer compensation system in Heilongjiang Province in 2016,* July 29
- Department of Statistics of Heilongjiang Province (2015), *Development status of leading food industries in Heilongjiang Province,* March 18. ·
- Agriculture Committee of Heilongjiang Province, Financial Office of Heilongjiang Province and others (2016), *Implementation of pilot project of compensation for farmers introducing corn and soybean rotation in Heilongjiang Province in 2016,* August 30.
- Website of the Ministry of Finance of China, *The Central Government strongly supports reform of grain purchasing and stockpiling system,* and China Financial News (June 16, 2016)
- Central Committee of the Communist Party of China (CCCPC) and State Council (2017), *Several opinions of CCCPC and State Council on further promotion of structural reform of agricultural supply side and acceleration of development of new energy for agricultural and rural development* (The 2017 Document No.1), February 5.
- China Network (2016), *North-eastern three provinces and one region to change their pilot corn support price system to "marketized procurement" plus "compensation",* March 28
- Zhang Jing and Wang Ke (2016), *Reform of pilot target price systems for agricultural products: Illustration of the reform in soybean industry*, Reform, Issue 7
- Chen Xilwen (2016), *Detailed information on the direction of China's food policy*, China Reform, Issue 3
- Chen Feilfeil and others (2016), *Analysis on effects of subsidy policy programs with soybean target price,* Chinese Prices, August issue
- Tang Renjian (2017), *Press conference by State Council of China regarding the 2017 Document No.1,* February 6
- Du Ying (2016), *Improvement of price formation support systems for agricultural products is an urgent challenge to deepen rural reforms,* China Economic Times, September 12
- Ministry of Agriculture of China (2015), *Guidance of Ministry of Agriculture on corn production structural adjustment in "Liandaowan" district*, November 2.
- Ministry of Agriculture of China (2016), *National* crop farming *structural adjustment plan (2016-2020),* April
- Finance Office of Liaoning Province and Rural Economic Committee of Liaoning Province (2016), *Administrative management method of special fund for corn producer compensation in Liaoning province,* August 8.
- Wang Wentao and others (2015), *Policy evaluation on pilot soybean target price*

program and its improvement, Observation and Thought, 7th issue
- Akihiko Hirasawa (2015), *Price support systems and changes in coupled payments in CAP,* Research and analysis report (Europe) on overseas situation surrounding agriculture and trade sponsored by the Ministry of Agriculture, Forestry and Fisheries of Japan in fiscal 2014, March.
- Ruan Wei (2014), *A change in China's food security strategy－coping with increasing food demands with strategic combination of production increase and imports*, Nohrinkinyu, February issue.
- Ruan Wei (2015), *China seeking for deficiency payment systems－implementation of pilot systems for cotton and soybean producers and its results,* Nohrinkinyu, August issue.

Norinchukin Research Institute Co., Ltd.
9th Floor, Agri-Square Shinjuku Bldg.,
5-27-11, Sendagaya, Shibuya-ku, Tokyo 151-0051 Japan
E-mail: manager@nochuri.co.jp