Report on the State of China's Food Security

Ministry of Agriculture of the People's Republic of China

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The Chinese Government has all along attached great importance to food security in the country. Since the inception of reform and opening up, China has maintained a high growth rate in grain production. In early 1990s, China's grain output stood at around 450 million tons. In mid-1990s, China realized the historic transformation from a prolonged short supply of major agricultural products to a general equilibrium in demand and supply and even supply surplus in abundant years, and managed to feed its people through its own efforts, thus doing the wonder of supporting 21% of the world's population with less than 9% of the world's arable land. China's agriculture has since entered a new stage of development.

I. The State of Food Security

Since the 1996 World Food Summit, China has attached greater importance to food production at home and accumulated rich experience in preserving food security, resulting in surplus market supply, stable prices and continued improvement in food security. In 2002, The Chinese people possessed 356 kilogram grain per person, and consumed 51 kilogram meat products, 34 kilogram aquatic products, and 330 kilogram vegetable, surpassing the world average level. China's everyday per capita calorie intake surpassed 2,750 kilocalorie, protein more than 70 gram, fat 52 gram, which by and large reached the world average level. In general, China's food security has been effectively guaranteed, and its urban and rural dwellers are living a healthier and more nourishing life.

1. Domestic grain production surpassing consumption

In 1996-2002, due to agricultural restructuring and implementation of the policy of returning cultivated land to forests, China's grain production underwent a big swing (Figure 1). The sowing area first increased and then decreased. In 1996-1998, China's grain sowing area increased continuously from 112.5 million hectares to 113.8 million hectares. As a result, domestic grain output far surpassed consumption

demand and grain reserves saw a considerable increase. Since 2000, China's domestic grain sowing area has been on the decrease, dropping to 103.9 million hectares in 2002. This led to a plunge of grain output and year-on-year widening supply shortage. Due to adequate reserves, generally speaking, the surplus of supply over demand remained unchanged and production still surpassed consumption (Table 1). Of all food products, paddy rice, wheat and corn, despite deficient production in some specific years, enjoyed more supply than demand due to adequate reserves; the demand for soybean surpassed supply and large amount of imports were needed to keep equilibrium (Table 2).

Table 1. Supply and Demand of China's Food Products (1996-2002, unit: 10,000 tons)

Year	Food Output	Food Consumption	Balance
1996	50454	45927	4527
1997	49417	46087	3330
1998	51230	46557	4673
1999	50839	47103	3736
2000	46218	47926	-1709
2001	45262	48093	-2831
2002	45710	48453	-2743
Total	339128	330146	8982

Figure 1. Development of China's Grain Production

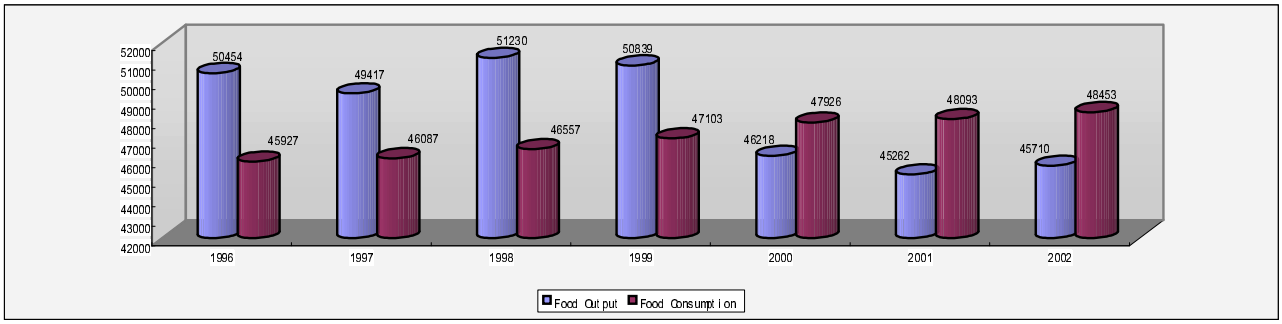


Table 2. Supply and Demand of China's Grain Production in Categories (unit: 10,000 tons)

Year	1.Paddy Rice			2.Wheat		
	Output	Consumption	Balance	Output	Consumption	Balance
1996	19510	16895	2616	11057	9674	1383
1997	20074	16905	3168	13239	9680	3559
1998	19871	16907	2964	10973	9698	1275
1999	19849	17048	2800	11388	9784	1604
2000	18791	17280	1511	9964	9922	41
2001	17758	17398	360	9387	10013	-626
2002	17454	17598	-144	9029	10148	-1119
Total	133307	120032	13275	75036	68918	6118
Year	3.Corn			4.Soybean		
	Output	Consumption	Balance	Output	Consumption	Balance
1996	12747	10540	2207	1322	1800	-478
1997	10431	10580	-149	1473	1950	-477
1998	13295	10680	2616	1515	2150	-635
1999	12809	10810	1999	1425	2260	-835
2000	10600	11000	-400	1541	2390	-849
2001	11409	11429	-20	1541	2497	-956
2002	12131	11336	795	1615	2568	-953
Total	83422	76375	7048	10432	15614	-5182

2. Abundant market supply of vegetable and fruit

In 1996-2002, China's vegetable and fruit production enjoyed rapid growth due to strong market demand. The sowing area for vegetable rose from 10.491 million hectares to 17.353 million hectares, up by 8.75% per year. Thanks to the increase of sowing area and per unit output, the aggregate output of vegetable jumped from 223.2 million tons to 528.6 million tons, up by 15.45% per year. In the same period, domestic vegetable consumption increased from 220.6 million tons to 523.7 million

tons with an average yearly increase rate of 15.5%. As a result, there was around 2.5-5 million tons of surplus every year.

From 1996 to 2002, China's fruit output increased from 46.53 million tons to 69.52 million tons, up by 6.92% per year, while its domestic fruit consumption increased from 52.89 million tons to 62.97 million tons, up by 2.95% per year. Consumption grew at a lower speed than production. In 2002, China's overall fruit output surpassed overall domestic consumption by more than 6.5 million tons.

3. Steady development of livestock and aquatic products

-- Output of meat products increased steadily. From 1996 to 2002, China's output of pork increased from 40.377 million tons to 43.266 million tons, up by 1.16% per year; beef output increased from 3.557 million tons to 5.846 million tons, up by 8.63% per year; muttons output increased from 1.81 million tons to 3.167 million tons, up by 9.77% per year and poultry increased from 10.746 million tons to 12.498 million tons, up by 2.55% per year (Table 3).

Table 3. Development of China's Meat Products (unit: 10,000 tons)

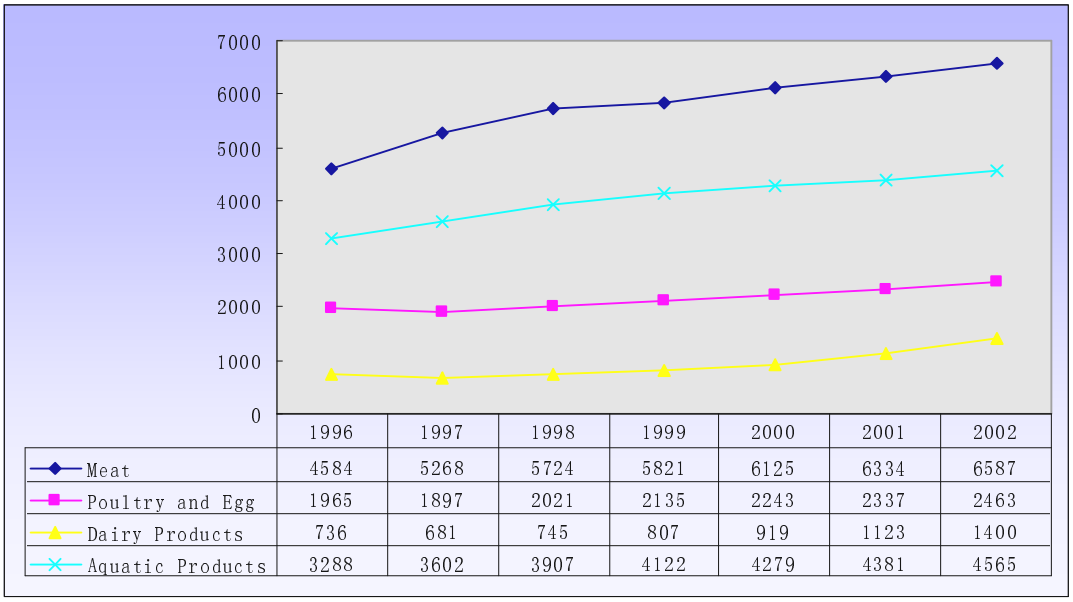
Year	Meat Output	Pork	Beef	Muttons	Poultry
1996	4584.0	3158.0	335.7	181.0	909.3
1997	5268.8	3596.3	440.9	212.8	1018.8
1998	5723.8	3883.7	479.9	234.6	1125.6
1999	5820.7	3890.7	505.4	251.3	1173.3
2000	6125.4	4031.4	532.8	274.0	1287.2
2001	6333.9	4184.5	548.8	292.7	1307.9
2002	6586.5	4326.6	584.6	316.7	1358.6

-- Egg supply increased steadily and production of dairy products grew by a large margin. From 1996 to 2002, egg production increased from 19.652 million tons to

24.627 million tons, a yearly average increase of 3.83%. Output of dairy products jumped from 7.358 million tons to 14.004 million tons, a yearly average increase of 11.32% (Figure 2).

-- Supply of aquatic products increased rapidly. From 1996 to 2002, the output of aquatic products grew from 28.13 million tons to 45.645 million tons, up by 8.4% yearly on average (Figure 2).

Figure 2. Development of China's Animal Husbandry and Aquatic Industry



	1996	1997	1998	1999	2000	2001	2002
Meat	4584	5268	5724	5821	6125	6334	6587
Poultry and Egg	1965	1897	2021	2135	2243	2337	2463
Dairy Products	736	681	745	807	919	1123	1400
Aquatic Products	3288	3602	3907	4122	4279	4381	4565

4. Steady development of domestic grain market

From 1996 to 2002, China's agricultural products market developed smoothly with a large increase of business volumes (Table 4). Food prices in general were on the decrease, reducing by 9.04% accumulatively. In terms of categories, grain price reduced by 21.41%, of which flour and rice price reduced by 21.85%, and coarse grain price reduced by 16.11%; dried vegetable price reduced by 2.07%, fresh fruit price 12.27%, dried fruit price 8.93%; fat price 25.73%, prices of meat, poultry and eggs 15.16%, and price of aquatic products 15.11%. Only the prices of fresh vegetable and other food were on the increase, of which fresh vegetable price rose by 9.97% accumulatively, and price of other food products increased by 2.21%.

Table 4. Development of China's Grain Market

Category	Sales Volume in 1996 (100 million yuan)	Sales Volume in 2002 (100 million yuan)	1996-2002 Average Annual Increase (%)
Grain and Oil	1141.1	2095.5	10.66
Meat, Poultry and Eggs	2754.0	4468.0	8.40
Aquatic Products	1134.7	2205.4	11.71
Vegetable	1590.0	2887.7	10.46
Dried and Fresh Fruit	980.4	1692.2	9.52

At present, a three-layered grain reserves system composed of state, local and household levels has been formed in China. Grain reserves remains at a high level, much higher than the internationally recognized security level. This helps to effectively offset market fluctuation.

5. Consumers' easy access to food

The purchasing power of urban residents has increased rapid. From 1996 to 2002, China's economy sustained rapid growth, with GDP increasing from 6,788.46 billion yuan to 10,479.06 billion yuan, an average annual increase of 7.94% after deducting the impact of price factors. Economic development has promoted social prosperity and stability and generated an increase of residents' income. The net per capita income of rural households increased from 1,926.1 yuan to 2,475.6 yuan, an average annual increase of 4.27%. The per capita disposable income of urban households increased from 4,838.9 yuan to 7,702.8 yuan, up by 8.06% annually. Steady increase of income has led to continued and remarkable improvement in the standards and quality of urban and rural residents' life. From 1996 to 2002, the Engel Coefficient of rural households dropped from 56.3% to 46.2%, and that of urban households dropped from 48.8% to 37.7%.

Table 5. China's Economic Development and Income Rise of Residents
(The GDP index of 1996 is set as 100, unit: yuan, %)

Year	Per Capita GDP Index	Urban Residents			Rural Residents		
		Per Capita Disposable Income	Income Index	Engel Coefficient	Net Per Capita Income	Net Income Index	Engel Coefficient
1996	100.0	4838.9	100.0	48.8	1926.1	100.0	56.3
1997	107.8	5160.3	103.4	46.6	2090.1	104.6	55.1
1998	115.1	5425.1	109.4	44.7	2162.0	109.1	53.4
1999	122.2	5854.0	119.6	42.1	2210.3	113.2	52.6
2000	130.9	6280.0	127.2	39.4	2253.4	115.6	49.1
2001	139.7	6859.6	138.0	38.2	2366.4	120.5	47.7
2002	149.8	7702.8	156.5	37.7	2475.6	126.3	46.2
2003	163.6	8472.0	170.6	37.1	2622.0	131.7	45.6

China's grain distribution system serves to ensure that grains go from producers to consumers smoothly. Chinese farmers are largely self-sufficient in grain consumption, with a weak dependence on the market system. Of rural grain consumption, around two-thirds do not need such intermediary distribution process as transportation and selling, and production and consumption are directly linked up. In addition, farming households have a high level of grain reserves. In mid-1990s, China opened up its grain sales market, while at the same time encouraged the development of village fairs of agricultural products. As there are numerous state-owned and individual grain sellers, the grain sales market is quite brisk and ordinary urban residents can buy the grains they need at anytime in their vicinity.

Low-income earners and poverty-stricken population gain necessary food from the minimum subsistence guarantee and government relief fund. The poor people in rural areas, those hit by natural disasters and the destitute urban dwellers receive government-funded disaster relief, unemployment relief and living subsistence allowance and their food is therefore guaranteed.

II. Policy experience in Ensuring Food Security

To guarantee food security at home, the Chinese Government has made unremitting efforts to stabilize the basic policy for rural areas, increase agricultural input, improve food distribution, raise the income level of its citizens and protect agricultural resources.

1. Stabilizing the basic policy for rural areas to motivate farmers' initiative for grain production

-- Adhering to the household contracting system. Since the inception of reform and opening up, the Chinese Government has all along emphasized its long-term commitment to the household contracting system, which offers long-standing guarantee for farmers' land-use rights. In 1984, the Government announced that the land contracting period would be extended for another 15 years. In light of farmers' requirement, in 1993, the Government once again announced its decision to extend the land contracting period for another 30 years. In 1998, the Government put forward the principle of "long-term commitment to household contracting system". At the end of 2002, it enacted the Rural Land Contracting Law, making it a law that "land contracted to farmers shall not be arbitrarily reallocated or recalled". At present, most local governments have signed land contracting certificates and contracts with farming households. At the same time, against the backdrop of equilibrium in supply and demand and even more supply than demand, the Government has still moderately improved food purchasing prices, and carried out pilot projects for rural tax reform. These efforts have reduced farmers' burden, increased the returns on food production, and protected farmers' enthusiasm for grain production. This serves as the fundamental guarantee for the stable development of China's food production.

----- Continuing to implement the policy of purchasing grains at protective prices. Since 1997, the Chinese Government has assured the farmers of purchasing their grains at protective prices. Despite the continuous bumper harvest and supply surplus in the market, the Government has still requested the state-owned grain purchasing enterprises to buy farmers' grains all year long with no quota restriction, no denial of

any willing sellers, and no arbitrary downgrading of grain levels and prices.

-----Providing subsidies for good strains and providing direct income subsidies to grain producers. Due to the low comparative returns on agriculture, offering agricultural subsidies through transfer payment is an important measure of most countries to preserve food security. After its entry into the WTO, the Chinese Government has honored strictly the rules of the Agreement on Agriculture and its WTO commitments by adjusting the forms and contents of its agricultural subsidies. Agricultural subsidies have been gradually transferred from the distribution process to the production process and direct subsidies started to be offered to farmers and agricultural production in keeping with the plan for development of production regions for competitive agricultural products. Meanwhile, China has formulated a plan for developing production zones for competitive agricultural products. In 2002, we worked out the plan for the development of 11 such production zones, including those for soybean and wheat production, and carried out pilot projects for high-oil high-yield soybean production in Heilongjiang, Jilin, and Liaoning provinces and the Inner Mongolian Autonomous Region. The Government has offered good strain subsidies to soybean producers. On the basis of the above soybean pilot projects, in 2003, pilot projects for the production of quality wheat for special purposes were carried out in Hebei, Henan, Shandong, Jiangsu, Anhui and Heilongjiang provinces.

----- Appropriately reducing agricultural tax for major grain producing areas. To galvanize the initiative of farmers in major grain producing areas and increase grain producers' income, in 2004, the Chinese Government carried out pilot reform for exemption of agricultural tax in Heilongjiang and Jilin provinces, reduced agricultural tax by 3% in 11 major grain producing provinces (autonsomous regions) such as Hebei, the Inner Mongolia, Liaoning, Jiangsu, Anhui, Jiangxi, Shandong, Henan, Hubei, Hunan and Sichuan, and reduced agricultural tax by 1% in other areas. While continuing to carry out good strain subsidy pilot projects for soybean and wheat production, the projects are extended to include paddy rice, and direct subsidies are offered to farmers' in major grain producing areas.

2. Improving the conditions for agricultural production and stabilizing and improving grain producing capacity

----- Strictly protecting tillable fields, basic farmland and other agricultural resources. As early as October 1994, the Chinese Government enacted the Regulation on Protecting Basic Farmland, which has ensured institutional protection of basic farmland. The Regulation was amended in 1999. According to the Regulation, basic farmland refers to the land designated as not to be illegally acquired for other purposed in accordance with the overall land use plan on the basis of the needs of the people and social and economic development for agricultural products. Once the basic farmland protection zones are designated, no companies, organizations or individuals are supposed to change or occupy, nor should they be left idle or deserted. In 2003, due to some tendency in some localities towards neglecting basic farmland protection in recent years, the Chinese Government issued the Circular on Further Measures to Implement Strict Farmland Protection System, emphasizing the imperativeness to carry out the strictest farmland protection system to effectively protect basic farmland and ensure that every village group and household are held accountable and every plot of basic farmland is protected in real earnest. Efforts have been made to rectify and straighten out various kinds of development zones, and resolutely reverse any illegal establishment of development zones and expansion of the areas the development zones occupy. At the same time, measures are taken such as controlling the scale of construction, establishing cropland compensation system to the effect that "the more you acquire, the more you must plow", and elevating land use authorization right to the competent departments of higher levels, so as to ensure a dynamic balance of aggregate farmland and stabilize grain producing areas.

----- Upgrading low- and medium-yield fields and tap non-tillable land resources. Since 1996, China has taken such measures as building water conservancy projects, increasing the use of organic fertilizers, soil improvement, and improving plowing techniques to upgrade more than five million hectares of low- and medium-yield farmland. Over 2,200 tons of more grain is produced on the upgraded land per hectare. China attaches great importance to the development and utilization of non-tillable resources such as wild hills, pastures and water area, and has developed grain-saving

animal husbandry, inshore aquatic industry and fresh water aquatic industry.

----- Spreading agro-science to improve unit yield. Since 1997, the Chinese Government has carried out various activities in all forms to expedite the transformation and spread of agro-science achievements. These achievements mainly include dryland nursing of paddy rice and light transplanting, paddy rice seedling throwing, quality paddy rice, wheat precision sowing, mulch cultivation, mulch cultivated corn, hybrid quality rape and mulch cultivated peanut. At the same time, the Government has sent agricultural technicians to rural areas to provide technical guidance and training and help farmers to settle technical problems. By 2002, more than 1,200 counties in 30 provinces or autonomous regions have carried out the "Green Certificate Project", which covers a wide range of areas such as crop farming, animal husbandry and veterinary, fishery, management of farming machines, economic management for rural cooperation, rural energy and rural environmental protection, and related posts in some of the township and rural enterprises. More than 12 million farmers received relevant training, of which about 4 million gained Green Certificates. All this has improved farmers' ability to adopt a scientific approach to farming.

3. Improving the quality of agricultural products and strengthening food safety

----- Pushing forward the strategic restructuring of agriculture and improving the quality of agricultural products. To meet the needs of urban and rural dwellers who have turned from making the ends meet to eating good food, since 1998, the Chinese Government has been committed to agricultural restructuring to improve the quality of agricultural products and realize regionalized agricultural production. In 2002, the sowing area of quality paddy rice in China accounted for half of the total area, that of quality wheat for special purposes accounted for 25% of all wheat sowing area, the sowing area for double-low rapeseeds accounted for 56% of the total rapeseed sowing area, and high-oil high-protein corn for special purposes developed from scratch and enjoyed rapid development. Green food and organic food have become important options of urban and rural residents.

----- Strengthening the establishment of quality standard for agricultural products and intensifying food safety management. The Ministry of Agriculture has been authorized to take charge of quality supervision and certification of agricultural products and green food and protection of new agricultural strains, coordinate examination, supervision, and authentication of the quality of agricultural input such as seeds, pesticides and veterinary medicine and enforcement of supervision and management. In 2003, the quality and safety supervision system for agricultural products and agricultural input started to be implemented, and quality and safety inspections at designated places, follow-up inspections and general inspections were conducted. At present, the quality labels for China's agricultural products include "Green Food", "Organic Agricultural Products" and "Pollution-Free Agricultural Products". Building on the success of the first group of pilot production bases for pollution-free agricultural products (crops), a second group of 100 pilot production counties or cities (zones) and 20 pilot export counties or cities (zones) for pollution-free agricultural products (crops) were designated nationwide.

4. Constantly improving grain distribution system and maintaining the stability of domestic grain market

----- Gradually liberalizing grain purchase. Until the end of 1990s, grain purchase in China had been monopolized by state-owned grain enterprises. In recent years, however, the Chinese Government has gradually lifted the restriction on grain purchase, and started to allow various kinds of entities to participate in grain distribution. In 2004, China further opened grain purchase market and allowed all qualified enterprises to engage in grain purchase on the basis of market demand. This not only ensures full circulation of grains and meets the market demand, but also guarantees farmers' basic profits.

----- Pressing ahead with regional integration of grain purchase prices. In accordance with the regulations on inter-provincial integration of grain purchase prices, leaders of relevant provincial (autonomous regions) governments participated in purchase price integration conferences for wheat in the North, paddy rice in the South and autumn crops in the Northeast, to set through consultation the specific price level,

quality-based price gap, region-based price gap and purchase scope for grains. This helps to ensure the normal and stable grain circulation in main producing and purchasing areas and realize rational allocation of resources and food safety of the whole country.

----- Strengthening the development of grain distribution infrastructure. In recent years, the distribution facilities for China's agricultural products have enjoyed rapid development and there formed an agricultural products market system combining the markets in producing areas, purchasing areas and distributing areas, with various wholesale markets at the center, urban and rural agricultural trade markets as the basis, direct sales and distribution and chained supermarkets as a supplement. In light of the existing problems in facility building for agricultural products circulation, the Chinese Government has made it one of the top priorities in national economic development in the Tenth Five-year Plan Period to speed up the development of related infrastructure so as to further improve the agricultural products circulation system.

----- Making good use of the world market to make up for shortage in domestic supply. China has been using the world market in a restricted way for products in other regions and certain varieties of products. We export paddy rice and corn while importing wheat and soybean. From 1996 to 2002, China's accumulative grain import reached 77.23 million tons, accounting for 2.28% of domestic grain output in the same period. Grain export totaled 64.63 million tons, or 1.9% of domestic grain output. The net grain import stood at 12.6 million tons, accounting for 0.37% of total domestic grain production.

Table 6. China's Grain Import and Export (Including Soybean, unit: 10,000 tons)

Year	Import	Export	Net Import
1996	1223	198	1025
1997	705	859	-154
1998	708	906	-198
1999	772	758	14

2000	1357	1400	-43
2001	1738	903	835
2002	1220	1439	-219
Total	7723	6463	1260

5. Increasing the income of low income-earners and improving residents' ability to get access to food

----- Establishing and improving the minimum subsistence allowance for urban residents and improving the food purchasing power of the low-income earners in cities. In 1997, the Chinese Government decided to establish a national minimum subsistence guarantee system for urban residents. Following that, the Chinese Government arranged special funds for the implementation of the "reemployment project" to provide skill training for the unemployed and help them find new jobs at an early date. At the same time, the unemployed can receive basic subsistence allowance to increase their food purchasing power. The Regulation on Minimum Subsistence Guarantee for Urban Residents formally came into effect as of 1 October 1999. Since then, all urban residents of families whose members' average per capita income comes short of the minimum subsistence guarantee standard of local residents are by and large eligible to receive basic livelihood assistance from their local governments. In 2001, a total of 11.71 million urban residents received such guarantee. The national expenditure for such guarantee was 4.2 billion yuan. In 2002, the fiscal budget for such a welfare system reached 10.5 billion yuan and the beneficiaries of such a system reached 19.3 million, accounting for some 5.8% of all non-farming population in China. In the first six months of 2003, the Chinese Government's accumulative investment in minimum subsistence allowance for urban residents stood at 7.1 billion yuan and a total of 21.8265 million urban residents received the fund.

----- Increasing job opportunities for farmers and raising farmers' income. First, introducing the market mechanism to the agricultural sector, directing farmers to adjust agricultural structure, choose crop types, and improve the quality of agricultural products on the basis of the market demand so as to improve the returns

on agriculture. Second, supporting the development of township and rural enterprises to create more job opportunities for farmers so as to increase their non-farming income. Third, relaxing the control over the movement of farmers, and encouraging them to find jobs outside of their villages to increase labor service-related income.

----- Helping poor areas with their economic development and guaranteeing food security of the poor population in rural areas. In June 1986, China established the State Council Leading Group for Economic Development of Poor Areas (which grew into the State Council Leading Group for Poverty Relief and Development in 1993) to organize, lead, coordinate, supervise, and examine the economic development of poor areas. From 1986 to 1993, the number of poor population who do not have adequate food and clothing dropped from 125 million to 80 million, down by 6.2% on average annually. In 1994, the China formulated the seven-year plan to help 80 million people out of poverty, with a view to helping 80 million poverty-stricken people in rural areas get enough food and clothing in seven years (from 1994 to 2000). Through our efforts, we are by and large able to meet the basic needs of rural poor for food and clothing. In face of the new situation in the new century, the Chinese Government formulated the Guideline for Poverty Relief and Development in China's Rural Areas to help the low-income earners in rural areas out of poverty permanently.

6. Protecting arable land and agricultural environment and realizing sustainable development of grain production and agriculture

----- Continuing to give special protection to arable land to ensure a dynamic aggregate balance. The Land Management Law of the People's Republic of China amended in 1998 further highlights the content about land protection. First, the scale of urban construction is controlled through overall planning for land use. It stipulates that the scale of urban, village or township construction shall not exceed that designated in the overall planning of land use. Second, all local governments must take steps to ensure that the total amount of arable land under their jurisdiction does not decrease. Third, a land acquisition compensation system is established. Companies or organizations that acquire arable land for non-farming purposes through approval must plow equal amount of land of equal quality in accordance with

the principle of “the more you acquire, the more you plow”. Fourth, land acquisition must first be approved by competent departments at a higher level. Construction projects that may occupy arable land must be approved by people’s governments at or above the provincial level.

----- Establishing pilot bases for water-saving agriculture in dry areas to protect and efficiently use water resources. To mitigate drought and water shortage that constrain agricultural and grain development, since 1996, the Chinese Government has invested a total of 1.1 billion yuan to develop water-saving agriculture, and spread such techniques as drip irrigation, spray irrigation, building ditches to avoid seeping, and transporting water through pipelines to avoid waste of water resources. At present, 300 key water-saving counties and 210 high standard water-saving irrigation pilot zones have been established, a total of 17.34 million hectares of water-saving irrigation projects have been completed, and non-project water-saving area reaches 13.34 million hectares.

----- Stepping up the development of eco-friendly agriculture. Since 1996, the Chinese Government has further intensified its efforts to develop eco-friendly agriculture. By now, 150 counties have conducted eco-friendly agriculture pilot projects. These counties are mainly located at overlapping areas of agricultural and animal husbandry zones with serious ecological problems in Northeast China, North China and the Northwest, including seven provinces and autonomous regions, namely Shaanxi, Gansu, Xinjian, Ningxia, the Inner Mongolia and Shanxi, as well as the hilly red soil areas in the South, black soil Mangang region in the Northeast, stone mountain areas in the Southwest, and the Three Gorges Dam Area.

----- Returning cultivated land to forests, pastures and lakes to improve agricultural eco-system. Since 1999, the Chinese Government has implemented the policy of returning farmland to forests in the upper and middle reaches of the Yangtze and Yellow Rivers. These areas are requested to return the sloping fields with an angle of more than 20 degrees to forests or pastures, remove all the dikes along the main rivers that may cause obstruction of the waterway, and gradually return all the cultivated land around the lakes that may obstruct floodwater storage to lakes. To encourage

farmers to return cultivated fields to forests, pastures and lakes, the Government has provided free seeds, food subsidies and a certain amount of cash subsidies to the relevant farmers, and adopted a series of policies, including one that stipulates "those who plant trees and grass shall become the managers and beneficiaries".

III. Prospect Analysis of Food Security

In the coming decade and more, due to population increase, accelerated urbanization process, income rise and some other factors, China's aggregate demand for grain will be on the increase. However, China has a huge potential in grain production. The Chinese Government will resolve the conflicts among the population, resources and environment, and continue to ensure food security of the country.

1. Forecast for grain demand

----- Population increase. China has all along adopted the family planning policy and the tendency towards excessively rapid population growth is well under control. From 1996 to 2002, the natural growth rate of China's population dropped rapidly from 10.42‰ to 6.45‰, with an annual average decrease rate of 0.516 per thousand (Table 7). However, due to a large base, the population approached 1.3 billion in 2003. In the coming decade, there will be an annual increase of six to eight million people on average. Calculated on this trend, China's population will approach 1.4 billion in 2010 and 1.5 billion in 2020. Population growth will put mounting pressure on China's food security. To meet urban and rural residents' demand for food will underpin China's economic development and social stability.

Table 7. Change of China's Population Growth Rate (unit: ‰)

Year	Birth Rate	Mortality Rate	Natural Growth Rate
1996	16.98	6.56	10.42
1997	16.57	6.51	10.06

1998	15.64	6.50	9.14
1999	14.64	6.46	8.18
2000	14.03	6.45	7.58
2001	13.38	6.43	6.95
2002	12.86	6.41	6.45

----- Food consumption structure. China is a developing country with a low urbanization level and the biggest number of farmers in the world. At the end of 2003, China's urbanization rate was 40.53%. In the coming decade and more, the rate will increase by 1% each year. And in 2020, the rate will reach around 60%. Since urban residents have a much higher consumption level than rural residents for food (grains excluded), accelerated urbanization will increase consumption demand for livestock, aquatic products, fruit and vegetable. In the foreseeable future, the importance of the above mentioned non-grain food security would become increasingly salient.

----- Aggregate grain demand. At present, China's per capita GDP stands at 1,000 US dollars. Urban residents' food consumption level suggests that they are by and large living a moderately prosperous life, and that of rural residents shows that they on the whole have adequate food and clothing. Compared with developed countries, the food consumption level of China's urban and rural dwellers, the rural residents in particular, is extremely low. In the coming years, with China's per capita GDP moving from 1,000 US dollars to 5,000 US dollars, food consumption of its citizens will enter a new period of structural upgrading. Their calorie and protein intake will further increase, greater attention will be paid to nutrition and hygiene, and the food quality and safety level will be considerably improved. In 2020, the food consumption level of Chinese citizens will reach that of a moderately prosperous society, a scientific and rational food consumption structure will be formed, and the per capita food consumption should reach at least 400 kilogram. The general food demand of 1.5 billion people is about 600 million tons.

2. Analysis on grain supply potentials

-----Grain growth potentials; China will have enormous potentials on grain production in the coming ten years and more. They mainly come from the following three

aspects:

(1). Improve the medium and low yielding farmland; At present, among the total area of farmland, about 2/3 of land belongs to medium and low yielding farmland. Based on the experience of improving medium and low yielding farmland since 1988, the per hectares yield on average can be increased by more than 1,500 kilos through building irrigation facilities, expanding irrigated area and popularizing advanced and applied technologies as well as adopting other biological measures.

(2). Develop and utilize non-cultivated land resources. China is rich in water area, grassland and mountains. Among 17.47 million hectares of inland water area, more than 6.75 million hectares can be used for aquaculture purpose. The utilization rate so far is around 70%. The area of marine water for aquaculture stands at 2.6 million hectares with the utilization rate of 30%. China is one of the countries in the world with the largest area of grassland. The total area of grassland is around 400 million hectares, out of which, 320 million hectares of grassland can be used. In south China alone, an area of grass mountains and slopes in hilly areas stands at more than 93 million hectares. The majority parts of that are yet to be developed. The mountainous area in China accounts for 70% out of the total land area, which will have a broad prospect in developing ligneous food.

(3). By relying on technology progress in agriculture, the unit yield will be increased.

At present, the contribution rate of science and technology in agriculture is approximately 45%, which is 60% lower than the average level in the developed countries. The science and technology-transformation rate is only around 30%-40%, with the utilization rate of fertilizer and irrigation water being equivalent to about 1/2 of the developed countries. China can raise the unit yield by a big margin for the major grain crops like rice, wheat and corn through enhancing technology-transformation rate and accelerating agricultural innovation. In terms of different regions, grain yield on per hectares basis has reached or exceeded 5000 kilos in more than 50% of counties in China, out of which, the yield has reached or exceeded 6000 kilos in nearly 20% of counties. However, the yield in 2002 was around 4400 kilos per hectares. From now on until 2020, there will be at least 15% of increase potentials. In terms of varieties, in 2002, the average unit yield of rice stood at 6,189 kilos, wheat 3,777 kilos, corn 4,924 kilos. Furthermore, the unit yield

of rice in high yielding farmland reached 8000 kilos, wheat 5000 kilos and corn 7000 kilos, or up by 29%, 32% and 42% respectively.

----Constraints for grain growth; China will also face sever challenges in grain production in the future. These challenges mainly come from the shortages and degradation of agricultural resources, poor foundation of infrastructure and deterioration of eco-environment.

(1). The shortages and degradation of agricultural resources. The total area of arable land in China accounts for less than 10% of the world total and water resources about 7% only of the world total. The amount of farmland and water resources on per capita basis is only about 1/3 and 1/4 respectively of the world average. At present stage, the area of deteriorated farmland in China accounts for 20% of the total farmland area, and that of deteriorated fresh water area for 33% of the total fresh water area. 90% of useable natural grassland suffers from various degree of degradation, with medium level of degradation reaching 50%.

(2). Poor agricultural infrastructure. With weak ability to resist natural diseases, drought and flood occurs almost every year, which have produced great losses on agriculture and grain production.

(3). The production scale by farm households is small and scattered. The production is vulnerable to the risk of domestic markets and blow of import of agro-produce. Against the background of economic globalization, the fluctuation of international market will worsen the domestic grain production and produce negative impact on its steady growth.

(4). The deterioration of eco-environment in agriculture is of great concern to us. Seven big rivers in China suffer from various degree of pollution. About 30% of river segments can be used as drinking water source. Some major lakes are severely polluted with nitrogen and phosphate, which has resulted in the problem of eutrophication. Some of offshore areas suffer from serious contamination. China has now become one of the three acid rain regions in the world, with the area of acid rain accounting for 40% out of the total area. The cultivated land with an area of more than 80 million mu suffers from acid rain and air pollution by various degrees. The area of farmland suffering from agricultural chemical contamination has reached 136 million mu. The contamination of “three industrial wastes” is spreading from local

places to the whole country. The desertification has accounted for 27.3% of the total land area. The speed of desertification has increased from 2,460 square kilometers in 1994 to 3,436 square kilometers in 2002.

3. The outlook of food supply

Given the conditions of domestic agricultural resources, production capacity and agricultural innovation as well as others, China is capable of maintaining a sustained growth for grain and agricultural production for the future ten years and more. By 2020, the overall grain production capacity in China will reach 600 million tons. China can fully rely on itself to realize a balance between grain supply and demand. We will not leave the food issue to the world.

-----Being different from Japan, Korea and other Asian countries and regions, the arable land area in China has not been experienced a rapid reduction during the process of fast industrialization. From 1990 to 2002, even though the policy of returning farmland to forest and lakes has reduced the area of arable land, the annual reduction of arable land area in China is still very limited, to about 300,000 hectares only. It is estimated that through the enhanced cropping indexes and measures on protection of capital farmland and rehabilitation of arable land due to the land occupation for construction purpose, China's grain sowing area for the future will stabilize at 100 million hectares for the long run.

-----China will have great potential in raising the unit yield of grain. Among the current available arable land, more than half belongs to medium and low yielding land. It is estimated that by 2020, the unit yield will reach 6000 kilos per hectares, with total grain production exceeding 6 million tons, which will basically meet the requirements by domestic grain markets.

-----China may make use of the opportunity brought by the economic globalization and regulate the surplus of domestic grain and non-grain food products. In recent years, the international environment for China's food security has been improved. The WTO's membership has provided China with the opportunity of using international resources and markets, regulating surplus of domestic grain and non-grain products as

well as ensuring food security. In line with the commitments of accession to WTO, China will continue to lower the tariff level, reduce non-tariff barriers and establish even more transparent trading system. China will strengthen the cooperation in grain and agricultural produce trade with Asian and the Pacific countries in an all-round way, actively make use of international markets to regulate the domestic supply and demand relations in grain, animal and aquatic products, vegetable and fruit with the aim of reducing pressure on resources and environment due to the increasing demand on grain, so as to realize a balance between grain supply and demand and sustainable development in agriculture.

——At any time, the Chinese Government will always pay much attention to grain and agricultural growth with emphasis on safeguarding and enhancing grain production capability. Firstly, the Chinese Government has been implementing the strategic plan with regard to strengthening overall grain production capacity. Secondly, the Chinese Government has been making great efforts to increase the inputs on building infrastructures for grain production and capacity building for raising high and stable yield, intensifying the support to the major grain producing areas and to farmers engaged in grain production, increasing subsidies to quality varieties and pushing forward the establishment of quality grain production zones. Thirdly, the Chinese Government has been pushing forward the rural reform and increasing incentives to farmers. The Government made a decision to reform the land occupation system, improve its procedure and strengthen arable land protection as well as safeguard farmers' land rights. The Government will also deepen the reform on grain distribution system and rural tax to fee system, increase the economic returns to farmers in grain production and reduce burden as well as mobilize their enthusiasm in crop farming. This will be crucial to safeguarding China's food security in the future.

IV. Future food security strategies and policy option

China has made a miracle in agricultural growth. She relies on insufficient agricultural resources and achieves a rather high self-sufficient ratio, thus making its due contribution to the world food security. In the process of gradually improved socialist market economy system and further opening up, the Chinese Government

will continuously readjust its development strategies, adopt more effective measures and realize the targets for ensuring domestic food security and safety.

1. **Protection of arable land and water resources, stabilizing and enhancing grain production capacity**

——Stringent measures on arable land protection. Sufficient quantity and quality of arable land will stabilize and enhance the overall grain production capacity. The Chinese Government attaches much attention to stabilize and safeguard grain production capacity. The State Council decided to adopt the most stringent measures to protect arable land, and made explicit regulations with regard to the implementation of the most stringent protection system, streamlining and rectifying wrong doings in terms of illegal land occupation in order to stabilize arable land area and improve land quality. At the same time, China pays attention to increasing the scope of protected area of arable land, with the emphasis shifting from stabilizing the available farmland area to protecting and enhancing arable land productivity while taking into consideration the quantity and quality issues and eco-environment protection. Attention has also been shifted from the current utilization of arable land to land adaptation, output, potentials and utilization rate, so as to protect and enhance the productivity of arable land. The practice is also shifted from protection of available arable land to the overall land resources, including cultivated land, garden land, forest, man-made grassland, water area for fishing farming and land reserves resources for cultivation. Efforts have been made to increase inputs to land development and reclamation in order to make good use of national land resources to ensure food security.

-----Intensify efforts on the protection of water resources. The total amount of water resources on average for many years stands at 2812.4 billion cubic meters with per capita amount of 2,220 cubic meters only, accounting for 1/4 in the world. China is one of 13 countries in the world, which suffers from severe water shortages with uneven distribution of water resources in terms of space. It poorly matches with land resources. 81% of water resources concentrate on the areas of Yangtze River and its south part, which accounts for 36% of the total arable land area across the country. However, Huai river areas and its north part, which accounts for 64% of cultivated

land area, receive about 19% of water resources. It characterizes as flood in the south and drought in the north with flood and drought disasters occurring frequently. With a view to enhancing water utilization rate and protecting resources, the Chinese Government will reduce the growing area for rice of high water consumption crops, and instead actively develop coarse grains that drought resistant, quality grass and other coarse grain crops. Efforts shall be made to research and demonstrate on water-saving technologies with emphasis on water-saving irrigation and dry farming. Good experience shall be summed up for developing water-saving agriculture. Agricultural demonstration zone for water-saving and dry farming technologies shall be set up, and supporting technical measures be extended, such as water-saving cultivation, biological, chemical and irrigation water-saving measures and collection of rain with the aim of enhancing water use rate in agriculture and reduce water waste.

-----Strengthen the building of agricultural infrastructure. The backwardness of agricultural infrastructure in China has greatly constrained the growth of grain production and relevant industries. The strengthening of agricultural infrastructure includes the following aspects: Firstly, improve agricultural investment and financing system and increase agricultural inputs in this regard; Secondly, strengthen the building of infrastructure for grain production with the focus on building of farmland irrigation facilities; Thirdly, strengthen the ability to resist natural diseases, build epidemic surveillance system and systems for disease control and prevention, testing and quarantine for hazard organism and system for agricultural disease resistance and reduction in order to mitigate the negative impact produced by natural disasters on grain production.

-----Promote agricultural science and technology progress and strive to improve unit yield and quality. Grain production in China has witnessed progress not only in quality, specialized and diversified varieties, but also in the enhancement of unit yield. During this process, technology advancement has undoubtedly played an important part in this regard. China will further intensify its efforts in the following areas, namely: support of grain production innovation, promote the conversion of research results into productive forces, continue to rely on technology progress and maximize grain variety structure and regional pattern in line with the requirements on quality for

different grain crops and conditions for resources, focusing on expanding the sowing area for quality rice, special purpose wheat and corn and quality soybean, so as to push the production of quality and special grain varieties moving towards regional and specialized production.

2. Press ahead grain restructuring and maximize production pattern

-----Accelerate the establishment of grain production zones with competitive edge and maximize production pattern. We will allow full play to the competitive edge for grain production in the middle parts of China, stabilize grain-sowing area and strive to enhance grain' quality and unit yield, while strengthening production bases for commodity grain, special grain for processing and feed grain, and increasing grain production capacity, so as to provide a stable and quality commodity grain to the State. We shall make our efforts in building the following production zones, namely: strong gluten wheat production zones in Huang,Huai and Hai River areas and Daxinganling areas, weak gluten wheat production zones in the areas of lower reaches of Yangtze River, quality and special purpose spring corn production zones in the Northeast part of China, quality and special purpose summer corn production zones in Huang, Huai and Hai River areas, quality double-cropping rice production zones in the areas of middle and lower reaches of Yangtze River, quality Japonica production zones in the areas to the east of Northeast part, high oil-content soybean production zones in the areas of Northeast and east part of Inner-Mongolia, high protein soybean production zones in Huang, Huai and Hai River areas, quality coarse grains production zones in Northwest and north part of Northern areas.

-----In meeting the needs of grain markets for quality, specialized and diversified grain varieties, efforts shall be made to actively develop quality and specialized grain production and maximize variety structure. First, readjust grain crop pattern, reduce the area of food ration production, develop production of feed and processing types, enlarge growing area of quality feed grass and silage corn in order to form a rational "three structures" production pattern for grains, cash and feed crops. Second, as food ration, processing and feed grain production requires different quality, a rational pattern of crops and varieties should be in place, and the area of producing quality rice, special purpose wheat and corn and quality soybean expanded.

-----Push grain industry into a commercialized operation and reach the goal for value-added processing; Efforts shall be made in linking production and marketing, developing agriculture through contract while pushing grain production into a commercialized operation, increasing grain production's benefits, revenue and farmers' income in the major producing areas. We will render strong support to grain processing enterprises, implement relevant policies and measures in helping the leading enterprises of agricultural industrialization, accelerate the development of food processing industry in grain producing areas and animal husbandry. We will continue to enhance the comprehensive economic results for grain production, making big provinces (big counties) for grain production become provinces (counties) of quality commodity grain production, food processing and livestock industry and promoting a steady growth of regional economy and stimulating farmers' initiatives in developing grain industry.

3. Deepen the reform in grain distribution system, give full play to the markets that play a role in guiding grain production and consumption;

——Continue to improve grain distribution system; Over the past few years, China has made tremendous progress in the market reform on grain distribution, with gradual improvement for grain market system. The role of market to regulate grain production and consumption has been continuously strengthened. The reform of grain distribution for next step will be focused on the following key areas: First is to actively cultivate and develop multi-element and qualified grain distribution organizations in line with the socialist market's requirements; Second is to accelerate the building of wholesale markets for grains and complete an improved grain market network while at the same time developing and standardizing futures' markets; Third is to complete the rules and regulations for grain markets, forming a benign order for grain distribution while guiding grain production and consumption by wholesale markets; Fourth is to regulate the inter-regional surplus grain at home with efforts made in the areas of law standardization, organization development and regional cooperation by focusing on targets set for unified markets in the whole country;

Fifth is to modify and perfect grain quality standards and strengthen their role in guiding grain production and quality improvement.

-----Continue to make use of international markets and regulate varieties and local surplus and deficiency through import and export; Grain import and export are effective means to stabilize the domestic markets. Although grain production capacity at present time stabilizes at around 500 million tons, the constraint factors on agricultural resources and technology level will however, exist for a long period of time in the future. China will continue to import moderately from international markets in order to make up for domestic gap in grain, while continuing to export moderately some grain varieties with competitive edge, which will be conducive to stabilize international grain markets and relation between domestic supply and demand.

4. Complete macro-regulation system for grain, reduce food security risk

-----Pursuit of principles of relying on its own resources and safeguarding food security; If the proportion of grain import in a country is larger than the total domestic supply and share of imported grain bigger than the total amount of export, the potential level of food insecurity will be much higher. China, as a developing and big grain producing and consuming country, will not excessively rely on international markets to safeguard domestic food security and safety. China has been always depending on its own domestic resources to secure grain supply, while at the same time opening China's agriculture wider to the outside world, accelerating the reform of agricultural marketization and giving play to the active role played by import and export as well as regional regulations. In future, China will continue to rely on our own domestic resources and allow free play to market mechanism in order to safeguard food security.

----Strengthen grain risk surveillance and set up early warning system; Grain risk will

always come along with uncertainty, which may possibly happen in every segment from farm field to the dining table. The stagnation of information at any segment will possibly produce big fluctuation at grain markets. As a country with relative backward grain production, but bigger consumer of agricultural produce, China has always given top priority to the issue of grain risk. Grain production in China has ever experienced chronic stagnation, and furthermore, the changeable climate and other suddenly happening events will result in tense relation in grain supply and demand. The reason behind is that the weak ability on grain risk surveillance and a blank of risk early warning system are the realities. Therefore, grain risk surveillance and early warning will take the unfavorable factors like constantly emerged blow to grain markets as their priorities. We may consider setting up two early warning and forecasting systems for grain supply and demand and prices. We will release the relevant information on production, consumption, reserves, prices and import and export on regular basis with the aim of establishing a smooth information channels, thus providing effective service to grain production, distribution and consumption with these information.

-----Improve the system for grain reserves; By using storage handling capacity, we will strengthen macro regulation on grain markets. A complete grain reserves system will stabilize grain purchasing prices and protect farmers' initiatives in grain production on one hand, and grain reserves through storage handling capacity will play a role to regulate grain market and its prices on the other, so as to promote the stability of grain markets and improve the pricing mechanism. The Chinese Government will improve its grain reserves system from the following four aspects: First, set a reasonable reserves scale; Grain reserves will pay high price for its cost. The excessive reserves will increase state budget and bring negative impact on grain production and distribution. To this end, we have to adopt market mechanism to govern grain reserves, reduce storage cost and financial burdens of various levels. The saved financial resources will be used for grain production and enhance the overall production capacity. Second, establish a flexible in and out rotation mechanism for

national grain reserves. We will improve the examine and approval procedures on the central grain reserves rotation and truly set up a dynamic reserves system. Grain reserves purchase, rotation and marketing will adopt market operation modality. We will seize market opportunities and avoid circumstance like paying high price for buying in and offering low price for selling out. At the same time, rotation of grain reserves will take place in combination with grain purchase and its import and export, so as to give free play to reserves that regulate markets, with markets determining prices. Third, maximize the pattern of grain reserves. National grain reserves priority will be shifted to producing areas and marketing areas will set up local reserves. With the convenient transportation, the State sets up grain reserves in main producing areas, which may ensure the grain supply in marketing areas under the special circumstances. It will ensure the purchase and rotation with the aim of reducing operational costs and mitigating the pressure of grain reserves in producing areas as well as maintaining production capacity in the main producing areas. The marketing areas, in line with their realities, set up local reserves, which can not only ensure the local food security, but mitigate the pressure of grain supply and demand to some extent from producing areas. Fourth, perfect reserves system; The three level reserves where the central reserves will organically combine with local and farm households' reserves is set up. Under the conditions of socialist market economy, it is of vital importance to improve grain reserves regulatory system, which is one of the components in establishing national food security system. From the prospective of international practices and development trend, national reserves and local reserves must combine with farmers' reserves, the reserves system can play its role in regulating markets with the aim of guiding grain production.

5. Establish concept of science for development and address the food security issue in a comprehensive and stable manner;

-----Control population growth and guide consumption with scientific manner; We shall continue to follow the policy of family planning, control population growth and

enhance people's quality. We shall take the food and nutrition with Chinese characteristics, selecting diet pattern of low calorie, high protein and low fat. In line with the "Development Program for Chinese Food and Nutrition (2001-2010)", animal-origin food consumption such as meat, eggs and milk will be increased moderately, forming a rational and diversified diet structure with grains as the basis. We shall make full use of grassland and straw, explore more sources of feed and accelerate the development of grain-saving animal husbandry. Efforts shall be made to develop woody grains and oil-bearing crops.

-----Intensify efforts in poverty alleviation and ensure the food security for rural poor and low-income urban dwellers; Financial inputs for poverty alleviation shall be increased, responsibility system strengthened and effective result of poverty alleviation enhanced. We shall strive to improve production and livelihood conditions for transportation, telecommunication, power, drinking water, education and medical care in poverty-stricken areas. We will make our efforts to develop featured industries, create new channels for increasing income and reduce or prevent people from becoming poor again. The input mechanism for poverty alleviation should be completed and management of financial management strengthened. All the expenses under the account of poverty alleviation shall be subject to announcement, publication and rendering a account. Stringent examine and auditing will ensure poverty alleviation funds to be put in place in full, so that poverty-stricken farm households will be truly benefited. As for urban low-income dwellers and people with special difficulties, such measures as relief funds and low-priced food supply shall be adopted in order to ensure their basic food consumption.

-----Protection of natural resources and eco-environment, and achieve sustainable agricultural development; We shall strengthen the building of ecological agriculture and harness water and soil erosion in a comprehensive manner. Efforts shall be intensified to control industrial pollution, protect and improve agricultural

environment. We shall modify cropping pattern, combine crop farming with animal raising, increase the application of organic fertilizer and improve soil fertility. Some farmland area shall be returned to forest, grass and lakes moderately. We shall proactively develop rural biogas and small power stations, mitigate damages of vegetation, desertification and grassland degradation in an effort to containing the further deterioration of eco-system.

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China is a populous country and also a big consumer of grains. The food security in China will have an important bearing on world food security. Since 1996, the active action taken by the Chinese Government in fulfilling its commitments to the World Food Summit and tangible progress made are perfectly obvious. For the future ten years and more, China is confident and capable of securing food security by relying on its own resources, and will continue to strengthen exchanges and cooperation with various countries in the world, making new and greater contribution to the world food security.