

Agricultural Domestic Support and Sustainable Development in China



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LIST OF ACRONYMS AND ABBREVIATIONS

AMS	Aggregate Measurement of Support
AoA	Agreement on Agriculture
FAO	Food and Agriculture Organization
Grain to green	Conversion of cropland to forest and conversion of grazing land to grassland
NPS	Non Product Specific
OECD	Organization for Economic Co-operation and Development
PS	Product Specific
San nong	three agricultural problems in modern China, the issues of agriculture, rural areas, and peasantry
USDA	United States Department of Agriculture
WTO	World Trade Organization

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FOREWORD

Trade policy, and agricultural trade policy in particular, has an important contribution to make in addressing sustainable development challenges - as has been acknowledged repeatedly in the statements and proposals made by governments at the WTO. In particular, carefully designed agricultural trade policies can contribute towards ensuring that economic growth occurs in a sustainable and equitable manner, and can help overcome food insecurity and poverty, especially in rural areas. While reforms under the ongoing Doha Round of trade talks have widely been seen as a significant step toward achieving these objectives, governments and other stakeholders increasingly recognise that there is a need to ensure compatibility between domestic agricultural trade policies and broader public policy goals.

ICTSD is currently conducting a series of studies and policy dialogues aimed at exploring some of these relationships in major economies, looking not just at agricultural trade policies in developed countries such as the US and EU, but also in some of the larger developing countries, such as China, India and Brazil. To date, discussions of farm policy directions in the EU, under the bloc's post-2013 Common Agricultural Policy, have represented a valuable opportunity for domestic policy-makers as well as their trading partners to review the implications of agricultural trade policy for sustainable development objectives, as has discussion over the future of farm policy in the United States under Farm Bill legislation now expected in 2013. In addition to reviewing how current policies may affect internationally agreed goals in areas such as food security, these discussions have provided an opportunity for policy-makers and experts to share analysis on the implications of new aspects of the policy environment - such as the challenges posed by high and volatile food prices.

China's enviable economic growth rates, its structural significance in the global economy, its contribution to global greenhouse gas emissions and its significant share of world population have all helped to ensure that policy-makers and analysts have devoted particular attention to the country's policies on agricultural trade. However, a relatively new set of farm policy objectives, pursued through instruments such as rapidly-growing domestic support programmes and accompanied by a significant decline in food insecurity, have also helped to propel the country's chosen approach into the limelight - especially as others, such as India, have opted for quite different policy instruments to achieve similar overall goals.

With differences of opinion over the implications of China's support for particular commodities, and emerging interest in the extent to which the country's farm subsidies cause no - or at most minimal - trade distortion, WTO delegates remain keenly interested in the trade dimension of China's domestic farm policies. At the same time, ongoing discussions on climate change, biodiversity and food security mean that governments around the world continue to search for viable policy tools. China's experience in pursuing its objectives in these areas therefore represents a valuable contribution to the wider debate on these questions.

This study therefore seeks to deepen domestic and international policy-makers' understanding of the relationship between China's agricultural domestic support policies and broader public policy goals, by providing an evidence-based assessment of the extent to which China's current farm trade policies are successful in achieving economic, social and environmental objectives. We are convinced that, as such, it represents a significant addition to the evolving discussion in this area.



Ricardo Meléndez-Ortiz
Chief Executive, ICTSD

EXECUTIVE SUMMARY

Since the turn of the century, with the strengthening of its economic power, China has attached greater importance to the sustainable development of agriculture. The abolition of agricultural tax in 2006 signifies the start of changing agricultural policies in China. The implementation of agricultural support policies are determined by the development characteristics of agriculture and China's current conditions. China's agricultural development does not have a strong foundation. Most production is still subsistence agriculture with the obvious characteristics of a small-scale household farming economy; the supply and demand of agricultural products is tightly balanced, food security still needs to be guaranteed, the income level of farmers is still low and the characteristics of its dualistic economy are very evident. In addition, China will face great challenges in the coming decades around how best to solve the contradiction between economic development and environmental protection, climate change mitigation and adaptation, safeguarding biodiversity, and the management of land and water resources for the sustainable development of agriculture.

Under these circumstances, in order to ensure domestic food security, improve farmers' income and realize the ultimate goal of the sustainable development of agriculture, China has put into effect a system of agricultural support policies which include four major subsidies (direct payments for grain production, comprehensive subsidies for agricultural inputs, a farm machinery purchase subsidy and subsidies for improved crop varieties) and other measures including minimum grain purchasing prices, temporary storage options and environmental protection. These policies have thus far achieved considerable results in ensuring food supply and improving farmer income.

In recent years, the level of support for agriculture has risen significantly in China and the range of subsidies available has expanded to a greater extent. But because of the large rural population, the average per capita subsidy is still low; the provision of subsidies on agricultural products are provided so as to meet the domestic consumption need, not to promote exports, as the policy does not involve export products in which China has a comparative advantage. In addition, it is obvious that China's current agricultural support policy is at an early stage. Most measures still focus on ensuring food security and improving farmers' incomes, whereas the attention afforded to sustainable development issues such as environmental protection is limited; specific measures to deal with issues such as climate change and the protection of biodiversity are yet to be established. Environmental protection measures are still at an exploratory stage.

Under the conditions set out by the WTO the implementation of China's agricultural support policy requires greater attention to the coordination of the aforementioned objectives and effects. More importantly, wisdom and effort is needed to design policies to realize sustainable development objectives in the areas of environmental protection, climate change mitigation and adaptation, safeguarding biodiversity and managing land and water resources. On the one hand, this requires the support of policies to improve farmers' incomes so they are able to consider higher policy goals such as environmental protection. On the other hand, China's dualistic economic structure should be eliminated and agricultural support policies coordinated with other economic, social and environmental policies for these measures to reach their maximum effectiveness. Future urbanization and industrial development will pose greater challenges for food security and the improvement of farmers' incomes. More measures to realize the sustainable development of agriculture will be carried out and fulfilled. With the development of the domestic economy, it is foreseen that China will further strengthen support to its undeveloped agriculture sector, which is a crucial industry for sustained economic growth.

INTRODUCTION

Agriculture is a vital economic sector in China, the most populous country in the world. Facing a growing free market, sustainable development in agriculture is threatened by urbanization, industrialization, and the scarcity of natural resources (such as limited land and water) and pollution due to the overuse of fertilizers and other chemicals. In the 21st century, with the Chinese economy growing quickly, the implementation of agricultural policies is strongly supported by government fiscal spending. A significant milestone in the development of agricultural policies in China was marked by the abolition of agricultural tax in 2006, which represented a switch from taxes collected from agriculture to subsidies for agricultural production. The fact that the agricultural sector in China should be supported and protected has become widely recognized and approved of in China.

Agricultural support policies in China are designed to affect the existing conditions of the domestic economy and the phase of agricultural development. After exploring in recent years how best to support and protect agriculture, the Chinese government has created a policy system which is characterized by four direct subsidies: direct payments for grain production, comprehensive subsidies for agricultural inputs, subsidies for improved crop varieties and a farm machinery purchase subsidy. These subsidies are doing well in certain aspects such as positively stimulating

the productivity of farmers. However, it cannot be denied that problems still exist in the execution process of these policies. More importantly, there still remains substantial room for improvement before current policies can realize the sustainable development of agriculture. This calls for further policy reform and change.

The range and intensity of China's government subsidies for agriculture have attracted widespread attention from around the world. Taking the country's present socio-economic and political conditions into consideration, along with its agricultural development trajectory, this paper will clarify and explain China's agricultural support policies in the light of WTO regulations, with an emphasis on evaluating program effectiveness in promoting and realizing the goals of agricultural support policies in China.

This paper will be divided into six sections. The first two sections introduce the social and economic background and the goals of China's agricultural support policies. The following two sections mainly focus on introducing China's agricultural support policies and analyzing the level of various types of support in the context of both China's national legislation and WTO rules. The last two sections evaluate the effectiveness of these agricultural support policies in achieving established goals and provide suggestions regarding the potential improvement of agricultural policies.

1. BACKGROUND: CHARACTERISTICS OF AGRICULTURE AND THE RURAL ECONOMY IN CHINA

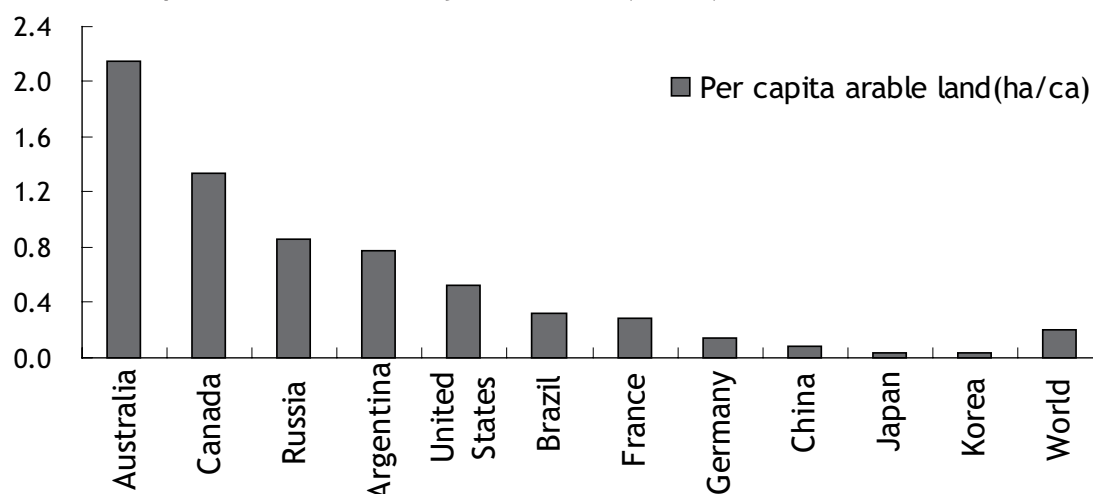
The characteristics of agriculture and the rural economy present the most important issues for consideration of the factors behind agricultural and rural policies. They also provide the key to an accurate understanding of the nature of China's agricultural support policies. China is a developing country with a large agricultural sector and its huge population results in limited agricultural resources per capita. The smallholder economy does not provide a decent income to farmers, leaving many below the poverty line who are largely self-sufficient. Agriculture in China can be largely described as subsistence agriculture, and urban-rural disparity is apparent within the nation's dualistic economic structure.¹ Given all these factors, agriculture plays an irreplaceable role in national food security, the livelihoods of farmers and in rural development. Beyond this, agriculture is vitally important for the social, economic and environmental aspects of sustainable development including the delivery of social security, the alleviation of poverty, its cushioning impact on the economy, the ability to carry forward cultural traditions and the conservation of the ecological environment. China's agriculture has the following three main characteristics.

1.1 Subsistence Agriculture

Firstly, restricted by limited agricultural resources, China's agriculture is dominated by smallholders. At the per capita level China has approximately 2/5 of the world's arable land, only 0.08 ha/ca, much smaller than Brazil, the US or France, and a little more than neighbouring Japan and Korea (Figure 1). The majority of agricultural production occurs at the household level. With 183 million rural households in 2009 the scale of production on average is only 0.66 ha farmland per household. Compared to other areas this equates to approximately 1/3 of Korea and Japan, 1/40 of EU and 1/400 of US (Ni, 2011). Land resource endowments vary substantially in China, but even in Heilongjiang Province (the most land-abundant province) the average scale of production is only 3.04 ha per household. In the 13 major grain-producing provinces the average scale of production is only 0.73 ha (Figure 2).

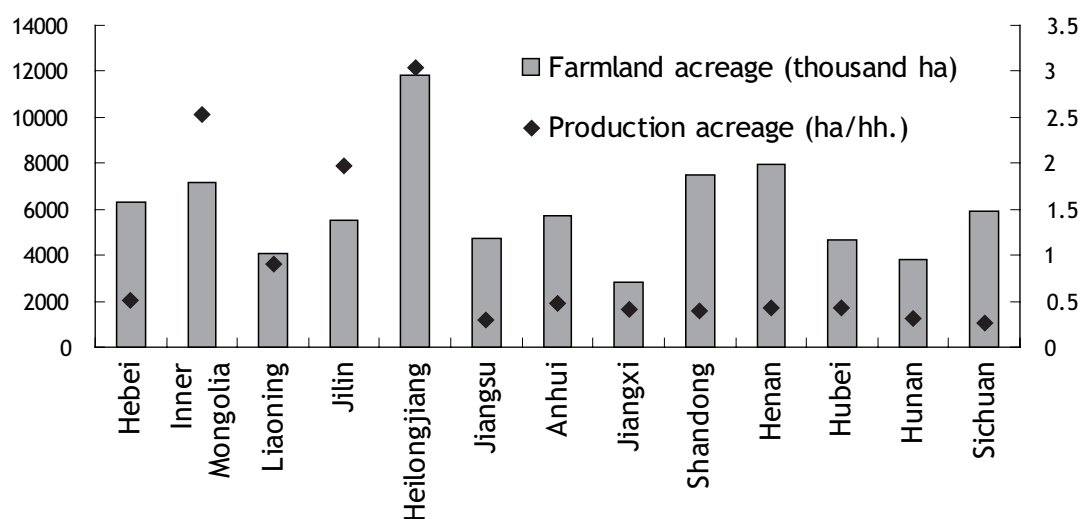
Secondly, agriculture remains the main source of income for millions of farmers. It is their means of livelihood. Out of 1.34 billion people, the rural population accounts for 670 million (those who stay in the cities for over 6 months are considered as urban in China's statistics).

Figure 1. Per capita arable land in major countries (ha/ca.)



Source: World Bank (2012).

Figure 2. Land availability of rural households in major grain-producing provinces (2009)



Source: China Statistical Yearbook (2010).

Note: Here "hh" means household.

For rural people in 2010, household operation income (mainly agricultural production income) accounted for 61 percent of total household income, and 48 percent of annual net income (Table 1). Further to this, from 2000 to 2010, the percentage of household operation income per capita in per household average annual net income dropped from 63 percent to 48 percent, while the same

percentage for salary income rose from 31 percent to 41 percent (Table 1). Although the percentage of household operation income has decreased during the past decade, it is still the most important income source for rural people. This is especially the case for farmers in the thirteen major grain producing provinces who are more dependent upon agriculture as a source of income (Table 2).

Table 1. Income mix of rural households in China (RMB/per capita.)

Indicator	1990	1995	2000	2005	2010
Average annual income/per capita	990.38	2337.87	3146.21	4631.21	8119.51
Salary income	138.80	353.70	702.30	1174.53	2431.05
Household operation income	815.79	1877.42	2251.28	3164.43	4937.48
Property income	35.79	40.98	45.04	88.45	202.25
Transfer income	—	65.77	147.59	203.81	548.74
Average annual net income/per capita	686.31	1577.74	2253.42	3254.93	5919.01
Salary income	138.80	353.70	702.30	1174.53	2431.05
Household operation income	518.55	1125.79	1427.27	1844.53	2832.80
Property income	28.96	40.98	45.04	88.45	202.25
Transfer income	—	57.27	78.81	147.42	452.92

Source: China Statistical Yearbook, various years.

Note: "Household operation income" refers to income by the rural households as units of production and operation. Operations by rural households are classified according to their economic activities namely agriculture, forestry, animal husbandry, fishery, manufacturing, construction, transportation, post and telecommunications, wholesale, retail and catering, social service, culture, education, health, and other household operations.

"Transfer income" refers to the receipt by rural households and their members of goods, services, capital or asset rights without giving or repaying accordingly, excluding capital provided to them for the formation of fixed assets. In general, it refers to all income received by rural households through redistribution.

Table 2. Income mix of households by region in 2010 (%)

Region	Salary income	Net production income	Property income	Transfer income
Eastern	50.6	38.0	4.4	7.0
Central	40.7	51.1	2.0	6.1
Western	33.9	54.4	2.6	9.1
Northeast	25.3	59.7	5.0	10.0
13 major grain-producing provinces	37.6	51.6	3.2	7.5

Source: China Statistical Yearbook (2011).

Thirdly, with minimal income a large number of farmers live below the poverty line². The annual per capita net income of farmers in 2010 was 5919 RMB (874 USD), less than a 1/3 of the disposable income of those categorized as urban. In accordance with the current poverty standard (a per capita net income of 2300 RMB) 128 million people still live under the poverty line nationally. The 2300 RMB standard is equivalent to an average daily income of less than 1 USD and even far lower than the World Bank standard of 1.25 USD per day. This means that, according to the criteria of the World Bank, the number of poor in China will exceed 130 million which accounts for about 10 percent of the total population. Nearly 97 percent of poor people live in rural areas. Agriculture in China has played and will continue to play an important role in the eradication of poverty and the protection of subsistence farmer livelihoods, and as such still requires strong policy support.

1.2 Food Security Centered Agriculture

For China, the definition of food security is different from that of the FAO, with its definition focusing more on the ability to physically procure sufficient supplies. China is a country with a population of 1.3 billion. Food security means ensuring the self-sufficiency of major food crops, especially wheat, maize and rice. A focus on China's food security therefore means focusing on the domestic production of major crops such as wheat, maize and rice.

Feeding 1.3 billion people remains the biggest challenge and the fundamental goal of the agricultural sector in China. China has hardly any ability to develop commercial agriculture

or pursue commercial interests such as the goal of agricultural development through agricultural trade. China has a comparative advantage in producing and exporting labour intensive products like vegetables and fruits, the export quantity of which is very small compared with domestic production and consumption. Considering the limit of land, water and other resources in per capita terms it is considered difficult for China to export large quantities of land intensive agricultural products (like wheat, maize and rice) which are vital to China's food security and currently serve to feed its large population and try to fulfill self-sufficient consumption.

Food security is a global challenge especially for countries with large populations, low incomes and lagging infrastructures. In 2011, production of the three major cereals³ was calculated at 2.06 billion tons, of which imports amounted to 267 million tons (13 percent of total production). Globally, over 85 percent of food is supplied through domestic production (Table 3) with trade accounting for less than 15 percent of food supply.

Being the most populous country, China consumes around 0.5 billion tons of three major cereals annually (Table 4). The production and consumption for the three major cereals in China contribute to 25 percent of the world total (which is around 2 billion tons). At present, the global import volume of the 3 major cereals is around 267 million tons (Table 3). If China imports 10 percent of its current consumption, its import volume will represent 20 percent of global imports. Rice, a major staple food in China, is a particular case. The

Table 3. Production and trade of 3 major cereals in the world (million tons)

Year	Production	Import	Share of import in production (%)
2000	1585	205	12.92
2001	1606	215	13.39
2002	1558	215	13.83
2003	1598	213	13.30
2004	1766	215	12.18
2005	1764	216	12.22
2006	1735	235	13.55
2007	1843	244	13.25
2008	1969	252	12.80
2009	1963	248	12.61
2010	1973	256	12.98
2011	2060	267	12.94

Source: FAO-CBS database for different years

Table 4. Supply/Demand of 3 major cereals in China (million tons)

Year	Production	Import	Export	Apparent consumption	Import dependency (%)
2000	393.54	1.17	13.65	381.06	0.31
2001	385.54	1.07	8.58	378.03	0.28
2002	386.14	0.88	14.64	372.38	0.24
2003	362.98	0.71	21.53	342.16	0.21
2004	401.33	8.03	4.32	405.04	1.98
2005	417.4	4.07	9.93	411.54	0.99
2006	441.79	1.41	5.86	437.34	0.32
2007	447.63	0.62	9.28	438.97	0.14
2008	470.27	0.42	1.56	469.13	0.09
2009	474.19	1.35	1.16	474.38	0.28
2010	488.19	3.19	1.03	490.35	0.65

Source: China Yearbook of Statistics (2011), statistics by China Customs.

global rice trade volume is only 35 million tons, less than 20 percent of domestic consumption. In 2020, China is expected to cut rice output by 7 million tons compared with 2011 in response to strong competition for land. However, global exports of rice are expected to reach about 41 million tons (OECD-FAO Agricultural Outlook, 2011-2020). If China complements the 7 million ton deficiency in domestic output by imports, it would exert incredible pressure on both Chinese and global prices.

Although imports are only one part of trade, and should not be thought of as representing trade more generally, for this reason, and also

because the three major cereals are considered important for China's food security, it is necessary to strengthen the understanding surrounding large imports of the three cereals and to emphasise the role of domestic supply. China is not against food imports; on the contrary, trade will satisfy ever-increasing markets for domestic consumption and relieve pressure on the environment and resources. China also stresses however that trade should not influence the healthy and safe development of domestic agriculture or the livelihood of farmers. That said, China has to achieve a necessary level of self-sufficiency through domestic means and cannot depend

upon global markets. The measures that will be taken internationally or domestically to realize agricultural sustainable development and the mitigation of climate change, such as converting cultivated land into forests, the implementation of rotational grazing, or the banning of grazing and the development of biofuels are likely to influence the balance of supply and demand for international grain. The implementation of related measures will cause great food security challenges in China. Given the large number of low-income subsistence producers with limited purchasing power, deficient domestic infrastructure and inadequate transport capacity it is unrealistic for China to ensure its major products are supplied through the global market.

Countries like the US, Europe and Brazil are also important to world food security. However, being the most populous country in the world and successfully feeding one fifth of the world's population, China has made a great contribution to global food security largely by huge progress in poverty alleviation and not only through increased food production (availability), but also through improved access to food. If China cannot ensure food self-sufficiency, it will be faced not only with fiscal pressure but political and moral challenges as well. From this perspective, realizing China's food security is essential to the stability of the world's food market. Achieving a necessary level of self-sufficiency with domestic resources is not only a practical choice determined by China's national conditions, but also a responsible policy option for a major country.

1.3 Agriculture Has Abundant Social and Environmental Functions in the Dualistic Economy

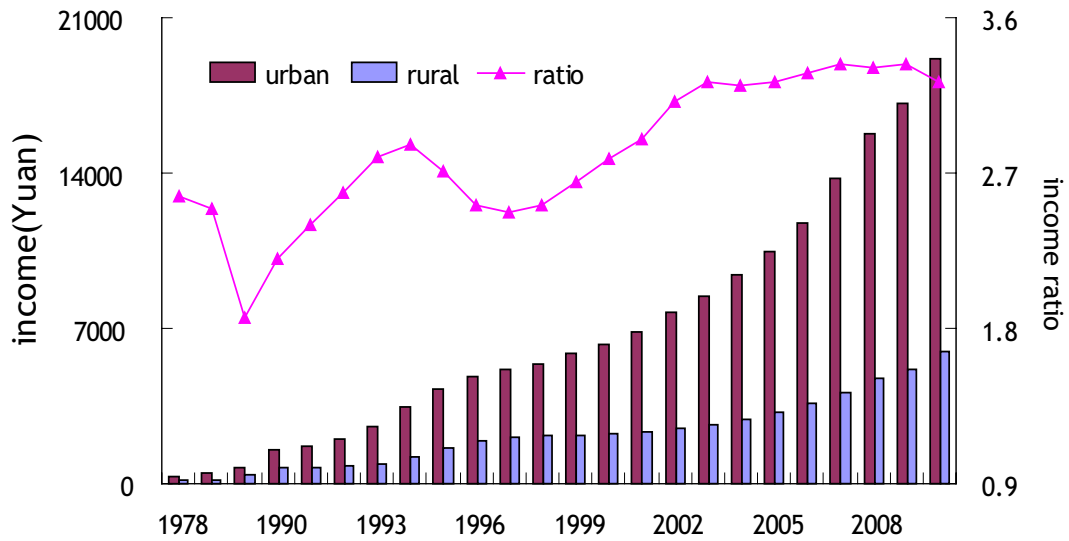
China's industrialization and urbanization picked up speed when industrial productivity was already very high, making its economy distinctly dualistic. The urban and rural gap is large in terms of labour productivity, income, infrastructure, social commitments and social security which restricts rural labour transfer in many respects.

Typical restrictions include the household registration system⁴ and the ensuing problems with disparate education, accommodation, job-seeking, health care and social security. Under normal circumstances, migrant peasant workers cannot achieve an identity change from rural to urban. This has caused a big dilemma in that large amounts of surplus rural labour swarms into cities because of freedoms surrounding job selection. However, they cannot acquire a permanent urban residence certificate. This household registration system results in the unequal treatment of migrant peasant workers who have to endure the same high prices for housing, consumer products and other living costs. As a result, most rural migrant workers are not able to blend into urban culture and return to rural areas when they retire. China's rural economy therefore still shoulders the responsibility of supporting the elderly as well as providing jobs and basic livelihoods for rural migrant peasant workers.

In spite of the continuous and rapid increase of per capita net income in rural areas urban and rural income disparity remains apparent and continues to expand. The urban to rural income ratio⁵ has grown from 1.85:1 in the mid 1980s to 3.23:1 in 2010, particularly in less developed regions and major grain producing regions in central and western China where farm income remains low and income growth remains a challenging task (Figure 3 and Figure 4). The dual economic structure of China makes it necessary to take urban-rural disparities into consideration while formulating new policies including agricultural support policies, social policies, environmental policies and other measures to increase farmer incomes and employment opportunities.

In addition, rural infrastructure and social commitments lag substantially behind cities. For example, urban coverage of social security is 84.7 percent (1527 RMB) in comparison with rural coverage at 34.6 percent (74 RMB, quoted from the Report of the National Working Committee for the Elderly). In fact, the medical insurance scheme, minimum

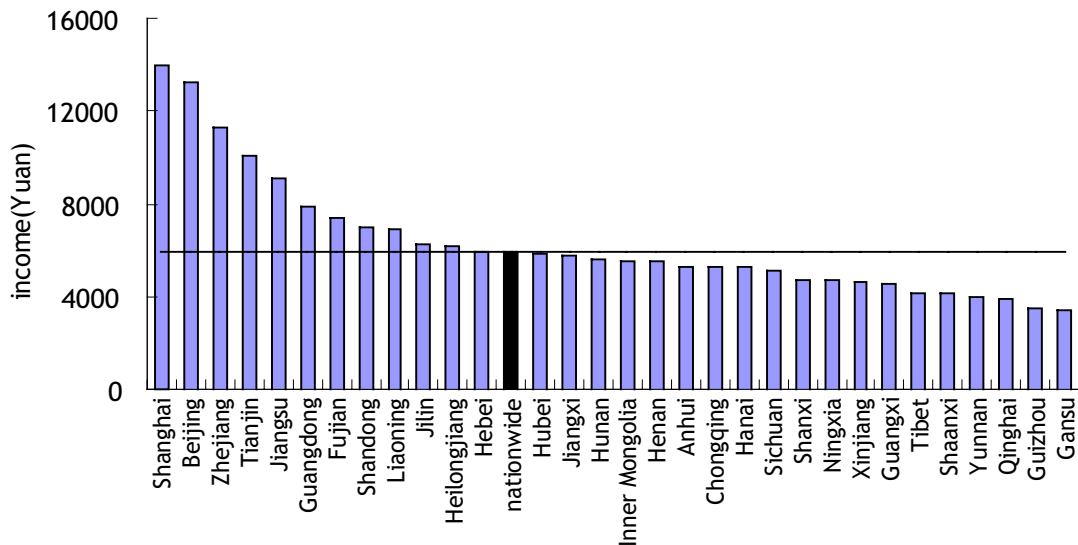
Figure 3. Urban and rural income in China



Source: China Statistical Yearbook

Note: Urban income refers to per capita disposable income of an urban family; rural income refers to the per capita net income of rural households.

Figure 4. Per capita net income of rural households in China by region in 2010



Source: China Statistical Yearbook

guaranteed income and unemployment system are all deficient in rural areas and only permit shallow compensation. Rural roads, cultural facilities, healthcare facilities and even drinking water infrastructure remains outdated. Rural insurance schemes covered 96.3 percent of the rural population in 2009 (annual per capita funding of 100 RMB with a reimbursement rate of 40 percent); in 2010, the minimum guaranteed income delivered only 12 RMB per capita for 5 percent of rural households among 128 million poor people (National Bureau of Statistics). In 2010, half of all rural households had no access

to cement or asphalt roads, and 22 percent of rural households had no access to safe drinking water. The Chinese rural social security project did not start until recently and still operates on a limited basis as a result of the country's dual economic structure. Its scale and coverage area cannot be compared with other more developed countries which have integrated systems for rural and urban areas.

Agriculture carries out many social, environmental and cultural functions in the dualistic economy, providing important positive externalities but at the cost of efficiency.

Firstly, while rural labour transfer is restricted in many respects, including through the declining absorption capacity of the cities and industries, agriculture provides unemployment relief to redundant rural labourers and the hidden unemployed. When the economy fluctuates agriculture cushions the impact by receiving laid off migrant workers. For example, after the financial crisis in 2008 many migrant workers went back to farming, a convincing case where agriculture cushions the economic impact and provides security. When the economic situation fluctuates migrant peasant workers go back to their homes in the countryside and start farming without having to worry about starvation or basic income. Rural areas therefore provide minimum social security arrangements for migrant peasant workers. In addition, by the standards of agricultural labour productivity in the US and EU, China does not need such a large number of rural labourers. However, disguised rural unemployment cannot be fully solved within a short period of time and agriculture has to continually provide employment security for the rural poor in near future.

Secondly, while ailing rural social security systems cannot guarantee full security agriculture provides alternative social secu-

rity mechanism. Agriculture is not merely an economic activity and the land worked on by farmers does not exist solely as a simple means of production. Agricultural production and traditional ways of living provide the most essential livelihood and pension security for those in rural areas. A small parcel of land is an important buffer for migrant rural workers. Providing a rural social security system is unavoidable a present and comes at the cost of agricultural efficiency and effectiveness.

Thirdly, agriculture plays an increasingly important role in eliminating poverty, carrying forward cultural traditions and conserving the ecological environment. Rural poverty is a prominent issue which has long been impeding social and economic development in China. China has thus far registered an impressive achievement in terms of poverty alleviation. Agriculture is not only an important source of livelihood for the rural poor but also acts as a practical choice for employment, income generation and development. As a result of the introduction of its grain-to-green program and despite intensive urbanization and industrialization Chinese agriculture still maintains value in carrying forward diverse cultural traditions and the conservation of its associated ecological environment.⁶

2. GOALS OF AGRICULTURAL SUPPORT POLICIES IN CHINA

Considering the basic reality of China's domestic socioeconomic and agricultural conditions mentioned above the goals of agricultural support policies should be gradually progressive. Policies should simultaneously focus on solving urgent conflicts and key issues in agricultural production including ensuring food security and increasing farmers' income. Long-term and ultimate goals should also be taken into consideration including the realization of sustainable development in agriculture.

Core Goals:

- **Ensure Supply:** mobilize the farmers' enthusiasm for growing grain; to ensure national food security; to ensure the supply of major agricultural products.
- **Promote income:** to reduce the cost of agricultural production; increase farmers' income and employment.

Long-term Goals:

- **Pursuing Sustainable Development:** food safety; agricultural modernization; environmental protection; mitigating and adapting to climate change; safeguarding biodiversity; managing land and water resources.

Ensuring food security and the basic supply of major agricultural products are the primary goals of China's agricultural support policy at this stage and are set to be for a long period in the future. It will become increasingly difficult for China to ensure a balance in the supply and demand of food and other major agricultural products. On the one hand, the limited arable land, fresh water and other agricultural resources will place greater constraints on food production. The motivation to grow grain will continue to decline and it will become more and more difficult to mobilize the enthusiasm of farmers to undertake the more arduous tasks of food production. On

the other hand, it is likely that the consumer demand for agricultural products will grow due to population increases, consumption structure upgrading and further urbanization. The goals of the policies should always be based on protecting the major domestic food supply.

Increasing farmers' income has always been the fundamental purpose of China's agricultural support policy. At present agricultural and rural development is hindered by difficulties surrounding the ability of farmers to increase their income. The relatively low income of farmers over a long period of time not only affects the improvement of living standards but also has an impact on food production and the supply of agricultural products. It not only constrains the development of the rural economy but also restricts entire national economic growth. An increase in farmer income is therefore fundamental in order that China is able to promote economic structural adjustment, further develop urban-rural integration and reform the current mode of economic development. Thus the core goals of the policies are to protect the basic interests of the farmers to grow grain and raise the level of farmers' income.

The ultimate long-term goals of China's agricultural support policy are to achieve the sustainable development of agriculture. In a growing open market environment policies should increase the support for agriculture in order to improve the quality of agricultural products, intensify scientific and technological innovation, accelerate the pace of modernization in agricultural development and improve the overall quality of agriculture. Meanwhile, long-term development requires efforts focused on protecting the ecological environment surrounding agriculture and the maintenance of an ecological balance. Attention should also be given to the heritage and diversity of agriculture and its associated rural areas in order that the highest goals of sustainable agricultural development may be reached.

It should be noted that the design of the current policies is still concerned with the above-discussed two key objectives. However, the proposed objectives for sustainable development are not specific enough and most do not include explicit implementation

methods as can be seen from the analysis of China's major agricultural support policies. More attention given to the design of policy objectives is needed to support future sustainable development goals targeting the environment, climate change and bio-diversity.

3. APPLICATION OF AGRICULTURAL SUPPORT POLICIES IN CHINA

This report will focus on domestic support policies since China has agreed on the removal of export subsidies, and issues relating to market access have been well analyzed in Tian (2009) which contains a discussion about import tariffs and tariff rate quotas.

Domestic support to agriculture has witnessed dramatic changes over the past 10 years. Agricultural tax, agricultural specialty tax, livestock tax and slaughter tax were rescinded (all abolished around 2006) and an improvement of public services began. Since then, China has introduced a series of pro-farm policies with four main subsidies at the core and implemented minimum price purchasing policies for rice and wheat, as well as temporary purchase and storage policies for maize, soybean, and rapeseed. With these in place, China has established a full set of agricultural policy support systems consistent with its WTO accession commitments and WTO rules. The attributes and characteristics of these policies are vital to ensure an accurate understanding of China's domestic support to agriculture under WTO rules.

3.1 Four Main Subsidy Policies

3.1.1 Direct payments for grain production

From 1999 to 2003 China's total grain output declined. Production in 2003 amounted to only 430 million tons which was then the lowest point since 1990. This alarmed the central government and from 2004 it began to apply direct subsidies to farmers growing grain. This policy was intended to encourage farmers to produce and stabilize the production of grain through compensating for increases in the cost of grain farming and ensuring reasonable benefits for grain producing farmers.

However, the operations of various provinces in China are not entirely consistent. On the one hand, during policy implementation, many provinces issued subsidies based on taxable land area, approved in rural tax reform, which are uncorrelated with actual planting area.

The primary aim of this policy is to encourage the distribution of subsidies according to the actual grain farming acreage. The number of provinces that implement this policy according to base area increased after 2005 and continues to do so. On the other hand each province determines the rate at which their own products are subsidized which creates differences among provinces. For example, Jiangsu only subsidizes rice, Shandong only subsidizes wheat, Hebei subsidizes wheat and maize, Heilongjiang subsidizes wheat, rice, soybeans and maize, and Liaoning subsidizes maize, rice, sorghum and wheat as well as other grains.

Between 2004 to 2007, total subsidies and subsidies standards have been gradually improved. Since 2008, total subsidy levels have essentially remained unchanged and have been maintained at the level of 15.1 billion RMB (Figure 7).

Given the name and purpose of the policy, this programme aims to promote grain output through subsidizing farmer's actual quantity of production. However, from the perspective of policy implementation these grain subsidies can be considered to be direct payments which are unrelated to international or domestic prices and production inputs. The policy therefore does not provide price support to producers. In addition, during the implementation process most of the subsidies administered by the provinces are not linked with the actual grain farming area or production. Instead calculations are based on the taxable land area certified in the agricultural tax reform, a figure which has not changed for several years. Local government simplifies the policy subsidy standard and the subsidy amounts to a certain amount of money per mu⁷ regardless of whether farmers grow grain or non-grain products like cotton. Due to the inconsistencies which exist between the policy objective and implementation method it is hard to determine the nature of this policy. We believe it is appropriate that direct payments for grain production belong to the section of decoupled

direct payments in Green Box subsidies as per China's notification to WTO.

3.1.2 Comprehensive subsidies for agricultural inputs

Since 2006, as a result of increasing price fluctuations for agricultural inputs such as diesel and the greater use of fertilizer (which has had a significant impact on grain farm income), the central government began to provide general subsidies for agricultural inputs in order to reduce production costs and relieve the effects of price hikes associated with agricultural input materials on grain production, such as diesel for farming, fertilizer, pesticides, plastic sheeting and other materials.

The total number of subsidies is constantly increasing and these subsidies amounted to 12 billion and 27.6 billion RMB in 2006 and 2007 respectively. In 2008, as fertilizer and diesel prices continued to increase, additional government investment accumulated to 71.6 billion RMB. A dynamic adjustment mechanism, applied to this policy since 2009, means that the measure should provide constant support and adjust to changes in the price of fertilizer and diesel for farming. Subsidy funds existed at 79.5 and 83.5 billion RMB (at budgeted figures) respectively in 2009 and 2010.

Under WTO regulations, given the name and purpose of the policy which aims to subsidize farm inputs and lower the production cost for farmers so as to influence production quantities, it would typically be classed as amber box spending. This subsidy was labeled as non-product-specific AMS (Aggregate Measurement of Support) in a recent notification to the WTO. It can be seen that the recipients of this subsidy are farmers whose livelihoods are related to agriculture. According to the flexibility given to developing countries in article 6.2 of the WTO AoA (Agreement on Agriculture), exemptions from inclusion into AMS are allowed for low-income or resource-poor producers. China, however, is bound by its WTO accession commitment to forgo such exemptions.

3.1.3 Farm machinery purchase subsidy

This subsidy provides specific funding towards farm machinery purchases in order to encourage farmers to use modern agricultural machinery, promote agricultural mechanization, comprehensively improve productivity, improve agricultural production efficiency, save costs and increase income.

The subsidy covers machines in 12 categories and 38 sub-categories⁸. It is provided to purchase farm machinery (at 30 percent of the purchase price) with a cap of 50,000 RMB for a single piece and 120,000 in particular cases. Farmers receive a discounted price with the price difference settled between the government and suppliers. Central fiscal spending for the farm machinery purchase subsidy was increased from 0.07 billion RMB in 2004, the first year of policy implementation, to 13 billion RMB in 2009. In 2010 15.49 billion RMB was budgeted for this program.

The farm machinery purchase subsidy attempts to subsidize agricultural input products and belongs to non-product specific AMS in the WTO amber box.

3.1.4 Subsidies for improved crop varieties

To encourage coverage of improved crop varieties, accelerate their extension, establish structure in the rural economy, standardize production and management and merchandize sales, subsidies for improved varieties were applied to soybean, wheat, rice, maize, cotton, rapeseed, highland barley, peanuts and potatoes from 2002.

The range of this subsidy has expanded constantly. Subsidies for improved varieties of rice, wheat, maize and cotton have achieved nation-wide coverage since 2009. Soybeans are subsidized across the whole of Liaoning, Jilin, Heilongjiang and Inner Mongolia provinces. Rapeseeds are covered in a similar manner in 10 major producing provinces including Jiangsu, Zhejiang and Anhui and in certain areas such as Xinyang (Henan Province) and Hanzhong and

Ankang (of Shaanxi Province). Highland barley is covered in all ethnic Tibetan areas including Sichuan, Yunnan, Tibet, Gansu and Qinghai. There is also a pilot programme for peanuts which began in 2010.

The total level of subsidies has increased continuously over time. Subsidies available for improved varieties increased from 100 million RMB in 2002 to 19.2 billion in 2009. In 2010 the budget for this subsidy approximated to 19.4 billion RMB. In 2010, 10 RMB per mu was allocated for early-season rice, wheat, maize, soybean, rapeseed, highland barley and peanuts. Further to this, an amount of 15 RMB per mu was applied for mid-season rice, late-season rice and cotton.

Farms can receive this subsidy through two ways. Either as a direct payment or through benefiting from discounted retailing prices. Direct payments deliver a certain amount of money per mu and subsidize farmers according to actual growing areas whilst discounted prices enable the sale of seeds at a reduced price to farmers. However, implementation methods vary among different provinces since both forms of the subsidy are applied together. For example, rice, maize and rapeseed are subsidized directly in every province. Concerning wheat and cotton however, Shandong province applies a discounted price while Jiangsu province distributes direct payments.

In China's notification to the WTO this subsidy was labeled as product-specific AMS, falling into the category of amber box support.

3.2 Minimum Purchase Price for Grain Policy

From 2002 to 2004 nationwide price support policies were removed. In 2004, after the establishment of a free grain trading market and the freedom to set prices, the policies surrounding minimum purchasing prices were reformulated to exercise macro-control on the basis of the market mechanism. To protect farmers' benefits, ensure grain supply and national food security, the central government applied a minimum purchasing price policy

to specific agricultural products. In 2004 a minimum purchasing price for rice was issued and was officially put into effect in 2005. A similar policy was applied to wheat in 2006.

China has introduced a policy for purchasing grains at a minimum price for rice and wheat in major crop producing areas, the price being fixed before sowing. In the application period (normally harvesting time), when the market price is lower than the minimum purchase price, government authorities purchase grain at the minimum purchase price. When the market price is higher the program remains dormant or is withdrawn.

A program was also initiated in the Indica rice producing regions in southern China in 2005. As of December the 10th 2010 the program purchased 36.17 million tons of rice cumulatively. The program for wheat was active for 5 continuous years since 2006 in major wheat producing regions and purchased 174.91 million tons of wheat in total. This policy exercised interventions upon market prices and can be considered to be a MPS (market price support) mechanism belonging to product specific AMS in the WTO amber box.

3.3 Temporary Purchase and Storage Policies

Since 2008 the Chinese government has implemented temporary purchase and storage policies for a number of agricultural commodities. Temporary purchases are accompanied by temporary storage measures for the sake of food security and cover rice, maize, soybean, rapeseed, sugar and pork. Among these chosen products, some are closely related to national food security (such as rice which is a main staple food in China), have an important impact on market supply and stability (such as maize, used as a feed grain, and pork), or are subject to a highly open market with sizeable imports (such as soybeans, cotton and rapeseed). The objectives of the policy are to fend off risks upon farmers' income and domestic market stability in the case of wild fluctuations in agricultural product prices. The program, implemented primarily in the interests of food security, has a limited impact

upon price since the quantity of purchased and stored commodities amount to far less than domestic production.

3.3.1 Temporary purchase and storage of grain and oil

In 2008 the state enabled the temporary purchase and storage of maize, soybean and rapeseed, mainly in order to ensure market stability and effective supply in case of a global price crisis. Compared with the implementation of the minimum price purchase policy, the temporary purchase and storage policy has two characteristics. Firstly, the products to which it is applied are non-staple foods with a long industrial chain and which enjoy a more international market. Secondly, purchase and storage prices are set when products are about to enter the market so that posted prices are close to market prices. China introduced temporary purchase and storage mechanisms for some agricultural commodities in 2008 to ensure market stability and effective supply. In 2008 and 2009 the government purchased and stored 13.66 million tons of rice, 40.66 million tons of maize, 5.33 million tons of soybean and 5.56 million tons of rapeseed. In addition, the government have entrusted some central and local enterprises to purchase products at a price no lower than the identified price for temporary purchase. The enterprises market the products and take their own profits/losses. According to the Ministry of Finance, the central government only covers “the interest for national grain and oil reserve and price difference”, which makes the program a public reserve instrument for food security and therefore a green box program.

3.3.2 Temporary sugar purchase and storage

The program exists to regulate the market and ensure market stability and effective supply. China has purchased sugar through open market competition several times since 2005. In 2008 sugar was purchased at a price of 3500 RMB/ton for 300,000 tons in the first batch and 200,000 tons in the second batch. Similarly, in 2009 500,000 tons and 300,000 tons of sugar were purchased at a price of 3300 RMB/ton

(the market price) in two batches. The central government only covered the “interest subsidy for national sugar reserve”, which makes the policy a public reserve instrument for food security and, again, a green box program.

3.3.3 Temporary meat purchase and storage

The program was mobilized in 2008 when plummeting swine prices in the domestic market resulted in huge financial losses for swine farmers and drew attention from the whole society. As the central reserve capacity was less than 1 million tons the local commercial reserve was expected to play a bigger role. The government encouraged enterprises to purchase and reserve meat through preferential measures such as bank loans and interest subsidies. Central pork reserves were decided and planned by the government while local enterprises were considered financially independent in terms of commercial pork reserves. The government provided subsidies for loan interests and this program can also be considered a public reserve instrument for food security, a green box program.

3.4 Environmental Protection Policies

Although environmental protection has always been a basic state policy the attention given to environmental protection is still comparatively less than that afforded to the improvement of agricultural commodity supply and farmers' income. The objectives and propositions of domestic environmental protection are still comparatively general and include issues such as water and soil conservation, ecological agriculture development and the development of the green economy. Most of these objectives still remain at the theoretical level and lack specific implementation measures. As a result of this their influence is considered to be much less than the four main subsidy policies.

Over a long period of time China's environment has deteriorated due to economic development and a lack of awareness surrounding environmental protection, excessive deforestation and grazing. The consequences have seriously limited the sustainable development of agri-

culture. In order to protect and improve the ecological environment in China the government instituted the policy of converting of cropland to forest in 1999 along with the conversion of grazing land to grassland in 2003. These policies are classed as Green Box subsidy measures for environmental protection.

3.4.1 Conversion of cropland to forest

In 1999 the first pilot test was carried out in Sichuan, Shaanxi and Gansu Provinces. In 2002 25 provinces (autonomous regions and municipalities) were officially involved. From 1999 to 2009 accumulative investment equated to more than 430 billion RMB and 415 million mu of farmland was converted to forest. In 2008 36.08 billion RMB was invested in forest recovery, 48.03 billion RMB in 2009 and 34.33 billion RMB in 2010.

As a result of the policy converting cropland to forest the central government provides 50 RMB per mu for seedlings to each rural household who lost farmland. In addition, staple food (always wheat) was provided according to a standard of 150 kg per mu in the Yangtze River Basin and 100 kg per mu in the Yellow River basin. Further to this 20 RMB per mu was allocated for the subsidization of living expenses. The state allocates the total subsidy amounts to each province every year according to the area of converted cropland. Since 2004, grants have been delivered directly to farmers in the form of cash instead of the previous provisions allocated as grain. From 2007, subsidies granted to households in the Yangtze River basin and southern regions amounted to 105 RMB per mu per year and 70 RMB per mu in the Yellow River Basin and northern regions. The previous 20 RMB per year per mu was still provided directly in cash to farmers

and is correlated with responsibilities to forest tending and care.

3.4.2 Conversion of grazing land to grassland

This policy was first applied in 2003. For eight years grassland fences were constructed on 778 million mu of pasture which involved 181 counties and 900 thousand farming households. Accumulative investment from the central government equated to 20.9 billion RMB, of which 1.96 billion RMB was invested in 2008, 3.66 billion in 2009 and approximately 3.2 billion RMB in 2010. As a result natural ecosystems in project areas have been progressively improving.

Since August 2011 new measures were implemented to improve the policy including the rational distribution of grassland fencing, the construction of stalls to support feeding and artificial forage land. In addition, the central government increased the subsidy rate and standard. The central investment rate also increased from 70 percent to 80 percent for fence construction, local investment decreased from 30 percent to 20 percent and county financial support was cancelled. In the Qinghai-Tibet Plateau central subsidies increased from 17.5 to 20 RMB for fence construction per mu and in other areas fence construction increased from 14 to 16 RMB. Subsidies for sowing grass increased from 10 to 20 RMB. The rate for artificial forage construction stands at 160 RMB per mu. In addition, since 2011 the feed grain subsidy was replaced by a grassland ecological protection grant for the project area. In areas where grazing is forbidden subsidies are provided at the rate of 6 RMB per mu per year lasting for five years. In areas where resting grazing and rotational grazing are applied a bonus of 1.5 RMB per mu per year was provided for farmers who did not engage in over grazing.

4. THE LEVEL OF AGRICULTURAL DOMESTIC SUPPORT IN CHINA

Over the past decade, the Chinese government has been attaching greater importance to agriculture. Support for agriculture has also risen significantly, catching international attention. The level of support for agriculture will be analyzed below.

China's agriculture is intertwined with farmers' livelihoods and rural development while agricultural support measures are closely connected with policies on food security, rural social affairs and rural infrastructure. In China the issues of agriculture, rural areas and peasantry are considered holistically under the concept of 'san nong'.

It should be pointed out that fiscal support to the 'three rural issues', which refer to 'san nong expenditure' widely used in China's official publicity and statistics, is more extensive and supports a range of areas other than those concerned with agricultural domestic support under WTO. The following analysis will discuss the level of China's agricultural support from both "san nong expenditure" and agricultural domestic support as defined by the WTO.

4.1 San Nong Expenditure in China

Government spending in san nong covers a large array of areas including supportive spending in agricultural production, subsidies to farmers' income and expenditure in rural social affairs such as education, culture, sanitation and healthcare. Government spending in san nong even covers the reclamation of rivers and lakes as well as the development of infrastructure such as rural roads, forests and drinking water facilities. Theoretically, domestic support to agriculture, as defined in the WTO's AoA, may be easily distinguished from other san nong supportive policies. However, this distinction is difficult to make in practice. For instance, many policies and projects are multi-functional and much general spending cannot be accurately allocated to a single item. If san nong support is calculated as agricultural

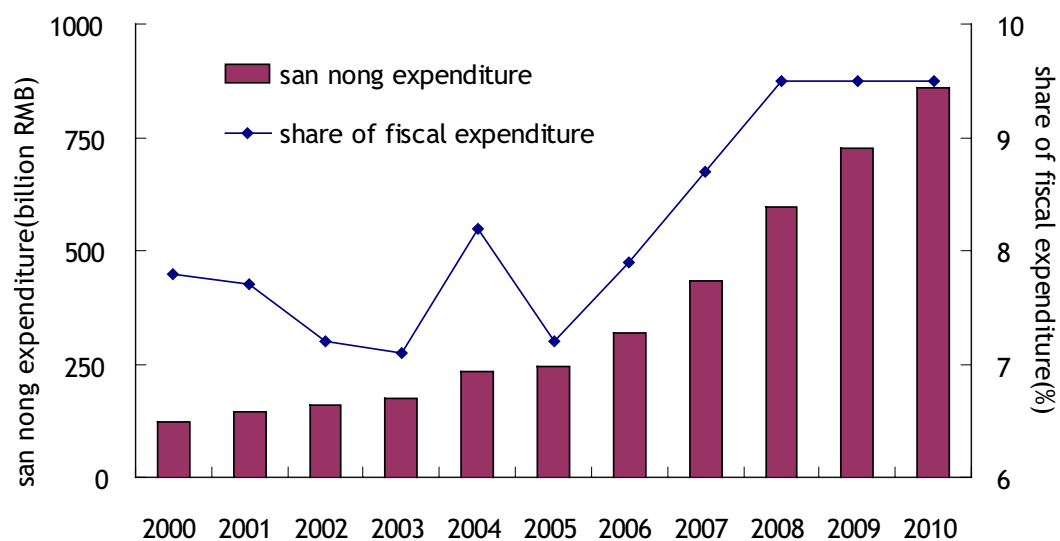
domestic support agricultural support in China will be substantially overestimated.

San nong issues are top priorities for the Chinese Government. As China gains economic strength government spending in san nong continues to grow, providing a positive spur to agricultural development and food security which increases farmers' incomes and promotes a 'new socialist countryside'⁹. Nevertheless, support to san nong is far from enough considering the huge agricultural population, low rural income, agricultural multi-functionality and the need to remove the dualistic economic structure.

From 2001 to 2010, government spending in san nong increased from 123.1 billion RMB to 858 billion RMB (Figure 5). Calculated at the exchange rate of 6.77, China's government fiscal spending in san nong equated to 126.7 billion USD (189 USD per capita of rural population) in 2010.

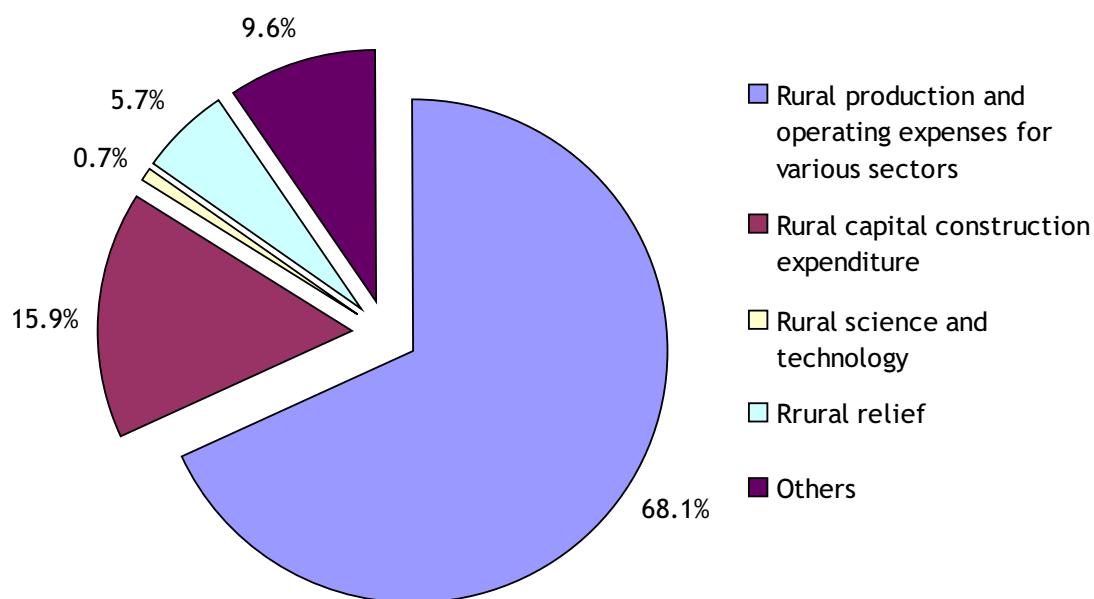
Before 2006 government san nong spending covered five main areas. These included rural production expenditure and operating expenses for agriculture, forestry, water and meteorology; capital construction; rural science and technology; disaster relief; and other comprehensive countryside development measures such as rural primary and middle school education and rural tax subsidies (Table 6). In 2006, government san nong spending totaled 317.3 billion RMB (Figure 5), of which spending in rural production and operating expenses for various sectors such as capital construction, agricultural science and technology, disaster relief and others amounted to 216.14 billion RMB (68 percent), 50.43 billion RMB (16 percent), 2.14 billion RMB (1 percent), 18.2 billion RMB (6 percent) and 30.39 billion RMB (10 percent) respectively (Figure 6 and Table 6). Rural production expenditure and various operating expenses accounted for 68 percent of the total spending, covering policies varying in nature. Operating expenses in the agricultural sector covered rural public utilities,

Figure 5. San nong expenditure in China



Source: China Statistical Yearbook on the Countryside.

Figure 6. Fiscal expenditure on san nong in 2006



Source: China Statistical Yearbook on the Countryside.

Table 5. Domestic Agricultural Supporting Policies in China

Policies	Policy Objectives	Starting time	Products
Direct Payment on Grain Production	Stimulate grain production motivation and improve the supply of agricultural products	2004	Main Grain products
General Subsidy for Agricultural Means of Production	Relieve the impact of the increased price of agricultural materials had on farmers, ensure reasonable profits in producing grain	2006	—
Farm Machinery Purchase Subsidy	Encourage consumption of modern agricultural machines, promote the pace of mechanization in agriculture, increase general agricultural productivity	2004	—
Subsidy to Improved Varieties	Encourage the use of improved crop strains, increase coverage of these strains and improve the quality of agricultural products	2002	Soybean, Wheat, Rice, Maize, Cotton, Rapeseed, Peanuts, Highland Barley
Minimum Purchase Price for Grain	Protect farmers' benefits and promote the stable development of grain farming stable food supply	2004	Rice, Wheat
Temporary Purchase and Storage	Stabilize the agricultural products market, and ensure national food security		Rice, Maize, Soybean, Rapeseed, Pork, Sugar, Cotton
Conversion of Cropland to Forest	Protect and preserve ecosystem in the West, reconstruction of vegetation r	1999	—
Conversion of Grazing Land to Grassland	Promote conservation and protection of pasture, protect and recover natural resources	2003	—

Source: Compiled by the author.

farmers' education, China-Africa agricultural cooperation and South-South Cooperation¹⁰, and the conservation of agricultural resources and ecology. Capital project construction covered rural roads and highways.

After 2006 government fiscal expenditure on san nong issues was readjusted. The new classification mainly covers three expenditures: rural production and various agro-related operating expenses, the four main subsidy policies and rural social affairs and development. In 2010 government san nong expenditure amounted to 858 billion RMB (Figure 5), of which 342.73 billion RMB, 122.59 billion RMB and 335.03 billion RMB pertained to the three aforementioned areas respectively (Table 7). Spending in rural production covers

rural capital construction, a premium subsidy for agricultural insurance, comprehensive agricultural development, fiscal funding for poverty alleviation, subsidies for soil testing and a formula fertilizer program, and finance for the training of farmers. Also included are various agro-related operating expenses covering the agricultural, forestry, water conservation, and meteorological sectors. Government spending in the four main subsidy areas refers to direct payments for grain production, comprehensive subsidies for agricultural inputs, the farm machinery purchase subsidy and subsidies for improved crop varieties. Spending on rural social affairs and development covers rural education, culture, healthcare, sanitation, minimum living allowance and disaster relief.

Table 6. Fiscal expenditure on san nong in China (billion RMB)

Year	San nong expenditure	Share of fiscal expenditure (%)	Rural production expenditures and operating expenses	Rural capital construction expenditure	Expenditures on rural science and technology	Expenditures on disaster relief	Others
2000	123.15	7.8	76.69	41.45	0.98	4.04	
2001	145.67	7.7	91.8	48.08	1.03	4.77	
2002	158.08	7.2	110.27	42.38	0.99	4.44	
2003	175.45	7.1	113.49	52.74	1.24	7.98	
2004	233.76	8.2	169.38	54.24	1.56	8.59	
2005	245.03	7.2	179.24	51.26	1.99	12.54	
2006	317.3	7.9	216.14	50.43	2.14	18.2	30.39

Source: China Statistical Yearbook on the Countryside. Statistical categorization for fiscal expenditures readjusted since 2007.

Note: Here operating expenses are for agriculture, forestry, water conservancy and meteorology etc.

Table 7. Fiscal expenditure on san nong in China (billion RMB)

Year	San nong expenditure	Share of fiscal expenditure (%)	Rural production expenditures and various agricultural operating expenses	Four main subsidies	Rural social affairs and development expenditure
2007	431.83	8.7	180.17	51.36	141.58
2008	595.55	9.5	226.01	103.04	207.28
2009	725.31	9.5	267.92	127.45	272.32
2010	857.97	9.5	342.73	122.59	335.03

Source: China Rural Statistical Year Book 2011

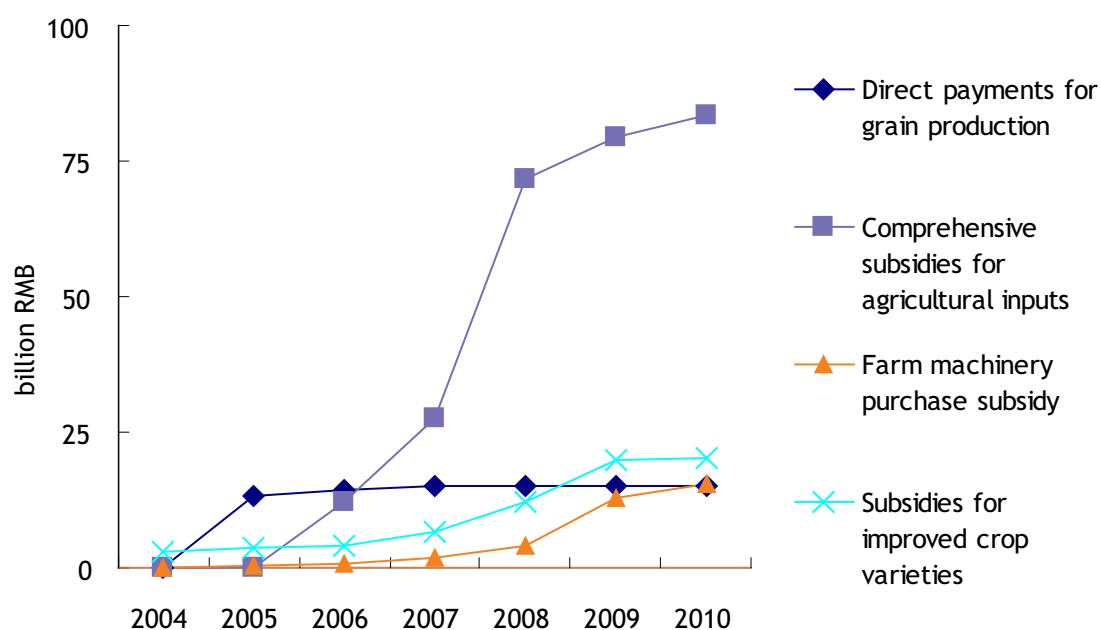
Note: Data in 2010 represents final figures not the budget. However, we have not found the final figures of these four subsidies respectively. A difference therefore exists between figure 7 (which is the budgetary data) and table 7.

Many subsidies in the first category (rural production and various agro-related operating expenses), among the three new categories of expenditure implemented after 2006, fall beyond domestic support defined by WTO rules, especially the various agro-related operating expenses which account for a significant proportion of the spending. These agro-related operating expenses however are mainly for administrative expenses and cover the salary of office staff. The second category (four main subsidies) consists of domestic support to agriculture. The third category (rural social and development) is irrelevant to domestic support to agriculture and is not classed as such. If we deduct the third category of spending from government spending on *san nong*, the total expenditure amount to 465.3 billion RMB (68.7 billion USD) in 2010, or 102 USD per capita among the rural population. If items not related to domestic support in the first category under the WTO rules are deducted, like various agro-related operating expenses for example, government spending in agricultural support will amount to less than 90 USD per capita among the rural population.

4.2 Agricultural Domestic Support by WTO Rules in China

As mentioned above it is difficult to differentiate between domestic support, classified under WTO legislation, and the complex *san nong* expenditures used in China's fiscal rules due to differences in the categorization and classification of support policies. According to China's WTO notification from 2005 to 2008 (competent authorities are working on China's WTO notification data of 2009 and 2010) green box support equaled 593 billion RMB in 2008 (Figure 8 and Table 8). Non-product-specific amber box spending amounted to 78.86 billion RMB, 1.5 percent of the agricultural output in that year (Figure 9 and Table 9). Product specific amber box support covered 7 products; wheat, rice, maize, soybean, cotton, rapeseed and swine. Amber box support for wheat equated to 6.5 billion RMB. Amber box support for the other 6 aforementioned products equaled 5.3 billion RMB (1 percent of output), 2.2 billion RMB (1 percent), 400 million RMB (1 percent), 2.8 billion RMB (3 percent), 900 million RMB (1 percent) and 5.2 billion RMB (0 percent) respectively (Figure 10 and Table 10).

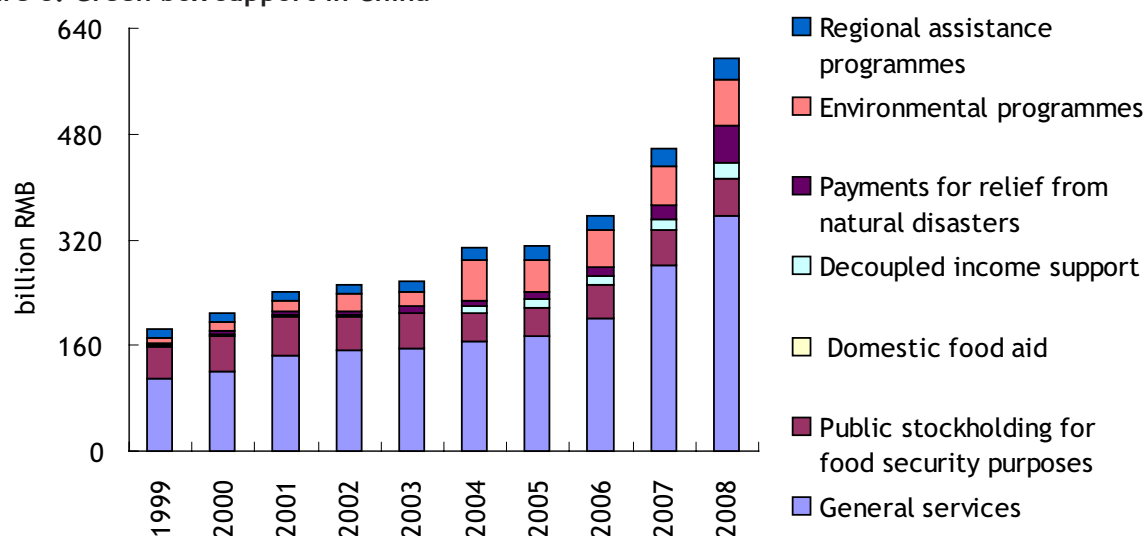
Figure 7. Four main subsidies in China



Source: Reports from Ministry of Finance on budget implementation and budget for next year, 2005-2011.

Note: Data in 2010 represents budgetary figures not the final subsidy level. Final figures for the four subsidies respectively are not available, accounting for the difference between figure 7 and table 7.

Figure 8. Green box support in China



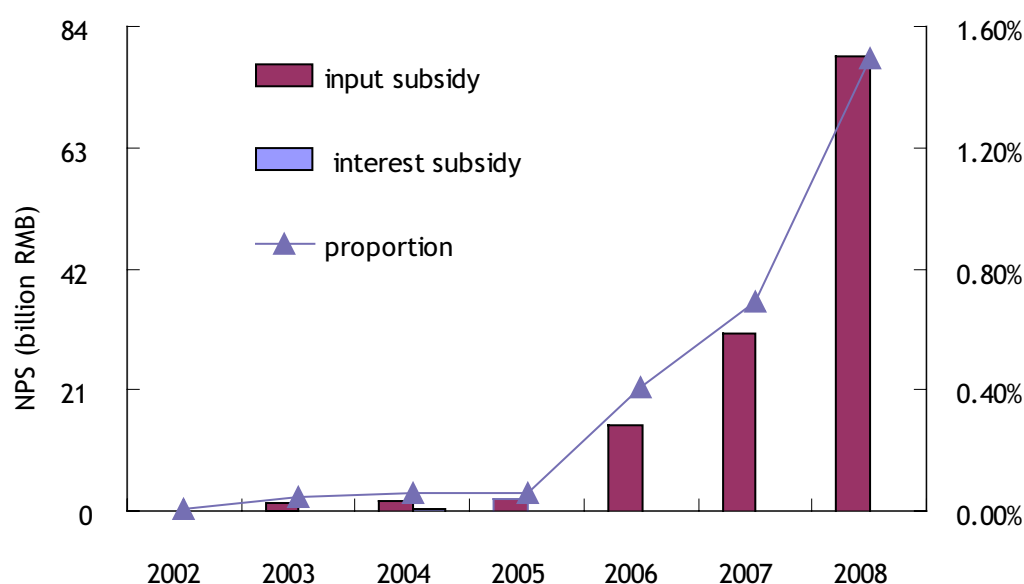
Source: China's notification to the WTO (21 March 2006 for notification for 1999-2001)

There are three significant aspects surrounding China's domestic support for agriculture worth noting through the examination of the figures.

Firstly, domestic support to agriculture in China conforms to the WTO rules and China's accession commitment. According to China's notification from 2005 to 2008, and at present, PS (product specific) and NPS (non-product specific) support in

China are below the maximum level of WTO rules which account for a small share of agricultural output. For example, product specific AMS support to cotton only accounted for 2.51 percent of its output value in 2008, the biggest of such a share among all subsidized products (Figure 10). In 2008, NPS support made up only 1.49 percent of agricultural output value (Table 9) which was far below China's WTO commitment.

Figure 9. Amber box support - Non-product specific



Source: China's notification to the WTO. Calculated by the authors.

Note: Proportion here refers to NPS (including input subsidy and interest subsidy); accounts for proportion of agricultural output.

Table 8. Green box support in China (billion RMB)

Year	General services	Public stockholding for food security purposes	Domestic food aid	Decoupled income support	Payments for relief from natural disasters	Environmental programmes	Regional assistance programmes	Total Green
1999	109.1	47.6	2.6	-	5.0	7.1	12.9	184.3
2000	121.2	53.8	2.4	-	5.3	12.7	12.5	207.9
2001	145.0	59.7	0.7	-	6.0	17.5	13.5	242.3
2002	151.4	53.1	0.4	-	6.0	26.2	14.9	252.1
2003	154.3	54.5	0.2	-	10.9	21.6	16.4	258.0
2004	165.6	42.1	0.1	11.6	9.3	61.6	18.1	308.5
2005	172.7	44.1	0.1	13.2	11.5	48.4	19.5	309.6
2006	200.8	50.4	0.1	14.2	13.2	55.8	22.0	356.5
2007	280.2	54.2	0.0	16.0	20.7	60.1	26.6	457.9
2008	355.7	57.9	0.1	23.6	55.4	68.9	32.0	593.6

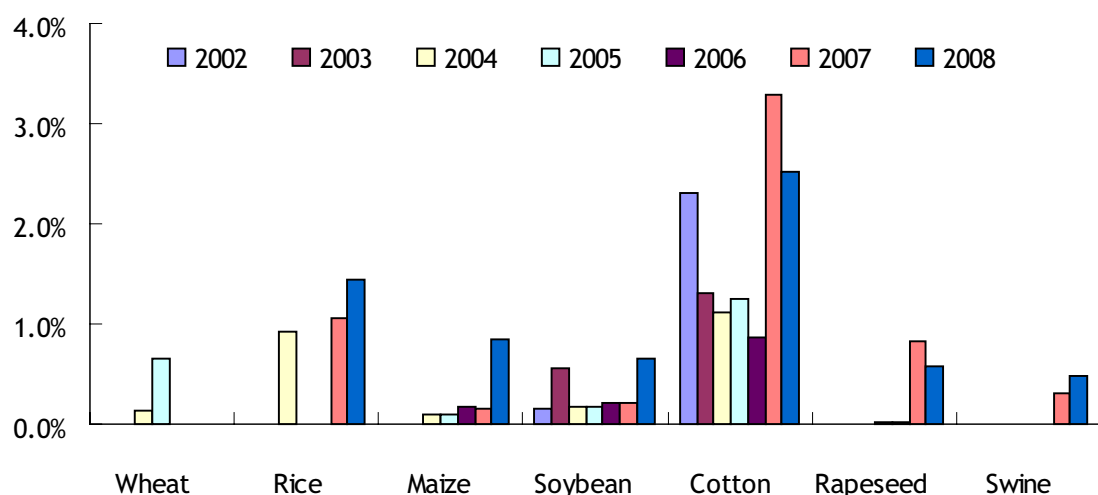
Source: China's notification to the WTO (21 March 2006 for notification for 1999-2001)

Table 9. Amber box support in China - Non product specific (billion RMB)

Items	2002	2003	2004	2005	2006	2007	2008
input subsidy (1)	0.17	1.25	1.58	2.16	14.84	30.63	78.75
interest subsidy (2)	0.07	0.03	0.40	0.04	0.11	0.13	0.11
non product specific (3)=(1)+(2)	0.24	1.28	1.98	2.20	14.95	30.75	78.86
Agricultural output(4)	2513.97	2646.39	3254.03	3543.48	3684.03	4443.54	5279.88
NPS accounts for Agricultural output (%)	0.01%	0.05%	0.06%	0.06%	0.41%	0.69%	1.49%
NPS support potential (5)=(4)*8.5%	213.69	224.94	276.59	301.20	313.14	377.70	448.79
Utilization of NPS support(6)=(3)/(5)	0.11%	0.57%	0.71%	0.73%	4.77%	8.14%	17.57%
Untapped NPS support potential (7)=(5)-(3)	213.45	223.66	274.62	299.00	298.19	346.95	369.93

Source: China's notification to the WTO (24 March 2010 for notification for 2002-200). Calculated by the author.

Figure 10. Amber box support -product specific



Source: China's notification to the WTO. Calculated by the author.

Table 10. Amber box support in China -Specific products (million RMB)

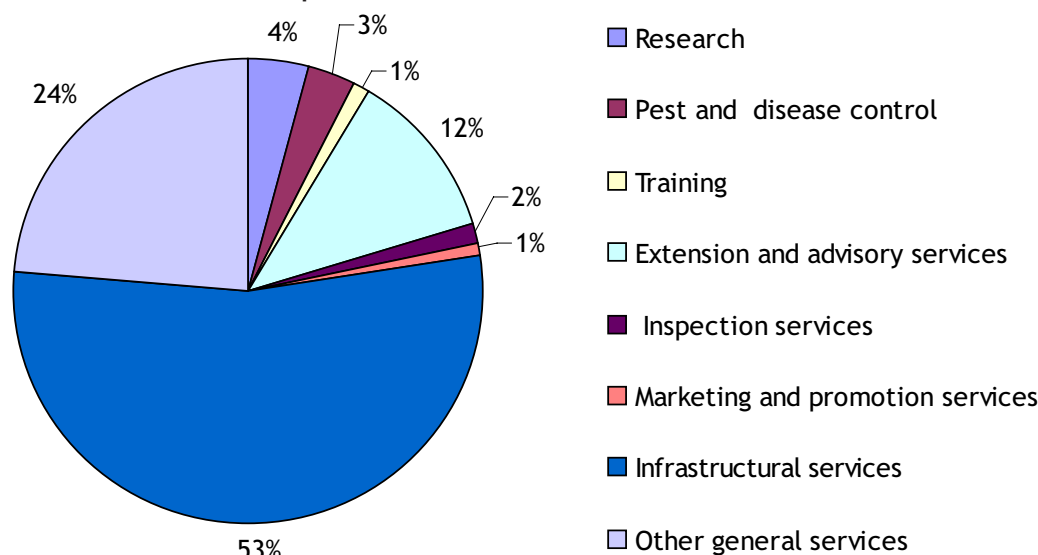
Product	2002	2003	2004	2005	2006	2007	2008
Wheat	-15,957	-12,125	201	1,058	-10,637	-7,230	-6,523
Rice	-17,331	-12,085	2,741	-11,946	-8,488	3,460	5,267
Maize	-6,759	-4,413	167	179	366	373	2,200
Soybean	70	280	112	110	111	111	412
Cotton	1,206	1,034	974	1,100	880	4,099	2,767
Rapeseed	-	-	-	7	6	1,005	886
Swine	-	-	-	-	-	2,433	5,233

Source: China's notification to the WTO (13 October 2011 for notification for 2005-2008).

Secondly, general service support contributed to around 60 percent and is identified as green box support in China's 2008 notification. From the structure of the general service expenditure (Figure 11), infrastructure services constituted the largest proportion (53 percent). The extension and advisory services, research, pest and disease control come next and expenditure on training, inspection services, marketing and promotion services is comparatively less. The above mentioned expenditure is essential to reaching the goals of sustainable development. For example, the

improvement of agricultural infrastructure such as farmland irrigation is indispensable to the development of agricultural production. What's more, the promotion of agricultural research and technology and training will build a solid foundation for the promotion of agricultural productivity, agriculture modernization and allow for the government to execute broader public policy goals. It may be worthwhile to provide a large amount of general service support as long as the notifications conform to the WTO requirements and will not necessarily cause more than minimal trade distortion.

Figure 11. General services expenditure structure of China in 2008



Source: China's notification to the WTO. Calculated by the author.

Thirdly, green box expenditure in some areas has grown rapidly in recent years. Payments for relief from natural disasters have grown rapidly in the past two years given the increasing incidence of extreme weather conditions and natural disasters, such as the 2008 Wenchuan Earthquake in Sichuan (a major food production province). It is also important to note that most of the disaster-affected areas are rural areas. In addition, the southern part of China was subject to severe frozen rain and snowstorms during the beginning of 2009. Another reason for this increase in expenditure is the growing fiscal power of the government which allows for more support for the rural residents in disaster-affected areas. Given the large target population for relief work, a small increase in the per capita relief standard will

result in a substantive growth in the total. The improvement of its environmental programmes is an indispensable feature of China's current economic transition (it is needed to develop environmental protection technology and focus on sustainable development). As a result of the accumulation of past environmental degradation there is much to be compensated for. In general, since China's environmental protection goals are not very clear and the specific measures for policy implementation are not formulated, if those policies are able to be put into effect environmental programme support will increase in the future.

However, in spite of rapid growth in recent years, green box domestic support amounted to only 885 RMB per capita (127 USD) in 2008.

In addition, some expenditure will lead to an overestimation of green box support. For example, among general service items, “others” (including administrative expenses, salary and an allowance for agriculture, forestry, water conservation and meteorology) accounted for 46.8 percent. Not all these expenditures are calculated as agricultural domestic support. Spending in agricultural infrastructure covers many areas concerning rural public utilities which results in an

overestimation of green box support. What should be stressed here is that these support mechanisms, such as those for administrative expenses, do not belong in any of the WTO’s boxes by their very nature. As a result of the unclearly defined statistical approach it is not easy to distinguish what belongs in the category of agriculture and non-agricultural sectors. It is because of this that some support measures that are not counted as agricultural support are still included.

5. ANALYSIS OF CHINA'S AGRICULTURAL SUPPORT POLICY

From the beginning of the 21st century, san nong issues became the focus of the central government. New policies are applied based on the following principles: secondary industry supports agriculture; urban economy supports rural economy; and greater support rather than taxation for agriculture. Since 2004 the central government instituted new domestic support policies including price policies, the four main subsidies and environmental protection support. These policies indicated the historical changes in agricultural policy in China. The characteristics of China's agricultural support policy in the new era are the following.

From the perspective of the design of policy objectives, China's current agricultural support policy focuses on the protection of food security and the improvement of rural income. Attention given to the goals of agricultural sustainable development is comparatively limited.

A look at the role that domestic support measures play on realizing the policy objectives would reveal that China's agricultural support policy places a priority on providing guidance for the behaviour of rural households, increasing grain production and farmers' income. However, very limited attention and policy possibilities are available for achieving sustainable development goals such as environmental protection and natural resource management.

Taking into account China's current conditions and its agricultural development the current policy measures still focus on the core objectives of "ensuring supply, and promoting income" (Table 5). The four main subsidies especially are the most widely used and incorporate the largest scope. Considering the background surrounding the introduction of the policies, the goals of the policies and the method of implementation it is obvious that the primary task of China's agricultural support policy is to stabilize the supply of major agricultural products (which will be difficult to maintain in

light of future needs surrounding urbanization and industrialization) and increase farm income which is still very low.

It should be admitted that there is much to be done to realize the goals of sustainable development in agriculture. On the one hand, the proposed goals are still comparatively general and only point out the broad objective of achieving sustainable development in agriculture. On how to achieve this objective and how China can balance and coordinate the different objectives there is no clear elaboration or list of feasible methods for implementation. On the other hand, there is a comparatively limited number of specific measures to reach the above mentioned objectives. For example, specific measures are lacking in the fields of climate change, the protection of bio-diversity and the management of natural resources. Some measures are still in their initial stage such as environmental protection. Although there are policies aimed at improving the environment, such as returning farmland to forest and pasture, they are not comparable to the four major policies in terms of publicity, support level or recognition from the farming community.

Judging from the existing policies, price support is still the core of the current Chinese domestic support. However, support is turning to the direction of the production process, especially direct subsidies to farmers which will become an important means of providing support for agriculture.

Market price support is at the core of the China's domestic agricultural support policy because it has a clear objective, yields quick returns and is easy to operate. However it could easily cause market distortion. It should be pointed out that the domestic minimum purchasing price has been lower than the market price in some cases which provides more by way of psychological support for the grain farmers. Whenever the market price is too low farmers can still sell their production at the minimum purchasing price stipulated by the government.

On the contrary, direct subsidies are not as effective as price support in stabilizing food production but do cause less market distortion. Chinese agricultural support policies are turning in this direction gradually, especially in the four main subsidy policies including direct subsidies. These indicate that the subsidies towards agriculture have been switched from an indirect subsidy process to direct subsidies in the production process to help maintain farmers' motivation in grain production and ensure basic profits for grain farming. These policies are the pillar policies of the current support system.

The level of total agricultural support has increased distinctly in the past decade; however, agricultural support is very low in per capita terms.

Since 2004 the total of the four main subsidy policies to agriculture has increased significantly from 100 million RMB in 2002 to 14.52 billion RMB in 2004, then to 122.59 billion RMB in 2010. With the increase in the varieties of direct subsidies, the wider range of subsidies and the amount of fiscal spending on agriculture has increased dramatically. The change from the nonexistence of subsidies to the current scale and their substantial growth has caught the attention of the whole world. Apart from the situation in which green box support was partially overestimated (as discussed in section IV), the substantial increase of domestic agricultural support is an undeniable fact and shows great potential for further growth in the future. One of the most essential reasons for this is the general realization that agricultural development is indispensable to China's economic development and that the improvement of rural household income is of crucial importance. In addition, the industrialization and urbanization progress and the strong domestic market demand have posed great challenges for the domestic food market which requires great attention focused on food production in the future, especially among the three main cereals. Under these circumstances, it is no surprise that the Chinese government has been starting to provide

substantial subsidies to agriculture. Although many policies aim to increase farmers' income and improve their rural livelihood, the level of support is still very low in per capita terms. In 2010, transfer income¹¹ gained by the rural household was 453 RMB (67 USD) (Table 1) per capita. Even calculated with the overestimated figures in China's notification to the WTO the per capita amount available to a single rural household that falls into the amber and green box is still minimal - 3737 RMB (536 USD) in 2008, much lower in comparison with developed countries (Table 12).

If the direct payments on grain production and the general subsidy for agricultural means of production are taken as an example (in most provinces, these two subsidies are given to farmers directly in same channel), under the current level of support the contribution of these two policies to the per capita net income of rural households is still low and does not exceed 5 percent (Table 13). In addition, because of regional differences, the effects of these two subsidies to farmers are not the same. For example, concerning subsidies for rural households, the highest is to be found in Hebei province (1159 RMB); for subsidies per mu of cultivated land, the highest is Anhui province (161 RMB); Hubei province administers the lowest per capita subsidy (Table 13). The level of the two subsidies is low on average. The contribution given with the purpose of increasing farmers' income per capita is significantly lower than the practical effects of increasing grain prices¹². It is difficult for farmers to consider subsidies as a major deciding factor in making decisions about future grain production.

Agricultural support policy in China mainly strives to stimulate production directly related to food security and rural livelihoods, and does not have the goal of promoting exports, so as to limit negative impacts on the international market.

Since 2004 China has become a net importer of agricultural products. After the implementation of a series of domestic policies the agricultural

Table 11. Share of domestic support in agricultural output in major WTO members (%)

Country	Green box	Amber box	Product specific	Non product specific	Blue box
U.S	36.30	4.00	1.90	2.10	0.00
EU	19.10	4.50	4.20	0.30	1.60
Japan	22.40	8.80	6.80	1.90	0.30
China	11.20	1.70	0.20	1.50	0.00

Source: latest WTO notification by countries; compiled and estimated by the author.

Note: the data is in 2009 for US, 2008 for Japan and China, and 2007 for EU.

Table 12. Agricultural domestic support in major countries

Items	US (million USD)	EU (million Euro)	Japan (billion Yen)	China (million RMB)
Green	103,214	62,610	1,848	593,015
Amber	11,525	14,743	724	89,105
Blue	-	5,166	22	-
Total Support	114,739	82,519	2,595	682,120
Number of Rural Households	0.75million	5.84 million	2.4 million	183 million
Green/hh	137,619	10,721	770,167	3,241
Amber/hh	15,367	2,525	301,792	469
Total Support/hh.	152,986	14,130	1,081,042	3,727

Source: latest WTO notification by countries; compiled and estimated by the author. 2009 for US, 2008 for Japan and China, 2007 for EU.

Note: The Amber Box Support is the total AMS.

Table 13. Contribution of direct payment on grain production and general subsidy for agricultural means of production to farmers' income

Items	Total	Hebei	Henan	Hubei	Anhui
Samples	215	39	60	60	56
Subsidy to per rural household (RMB/hh)	881	1159	877	807	773
Subsidy to per mu of cultivated land (RMB/mu)	116	132	86	90	161
Per capita arable land area (mu)	1.72	1.86	1.99	1.79	1.13
Per capita subsidy income (RMB)	199	245	171	161	182
Per capita net income of rural households (RMB)	4849	5150	4807	5035	4505
Per capita subsidy income of per capita net income of rural household proportion (%)	4.11	4.76	3.56	3.19	4.04

Source: Cheng Guoqiang (2011).

trade deficit remains large and has the capacity to grow further. The recent and dramatic change in China's agricultural trade pattern has largely been driven by massive imports of soybeans and, to a lesser extent, vegetable oils.

The agricultural trade deficit then rose from 1.18 billion USD in 2005 to 23.14 billion USD in 2010, an increase of 18.6 times, which is mainly the result of urbanization, industrialization, and increasing incomes within China.

Domestic support policies in China target products closely related to the livelihoods of farmers and grain supplies, such as wheat, rice, maize, soybean, cotton and pork. The purpose is to protect the effective supply of agricultural products and increase farmer enthusiasm for growing grain, rather than promote exports. However, products which are subsidized have become imports. For example, in 2010 wheat, maize, soybean, cotton and pork were all imported products. More importantly, the support policies do not involve aquatic products, fruits and vegetables and China's other major competitive export products; therefore they do not cause more than minimal trade distortion to the international market. This is essentially different from the subsidies European countries and US provide for their exported products and even products with a competitive advantage. In the US, product specific AMS covers dairy products, sugar, wheat, soybean, livestock, cotton, and maize, most of which are export products. Further to this, the 2008 Farm Bill provided wider subsidies and even included sunflower seed and rapeseed, as well as orchards, vineyards and nurseries, a total of 25 categories of products (Food, Conservation and Energy Security Act of 2008, USDA).

The design of the existing agricultural policy system is still relatively preliminary so there are inevitably some problems in implementing current policies. It can be seen that China's agricultural domestic policy system will be improved step by step under the framework of WTO.

Due to regional differences in the level of agricultural development and policy implementation there are inconsistencies in both the effects and objectives of policies. In this context direct payments for grain production become the most debatable measures. Cheng (2011) believes that because the subsidies farmers receive are directly related to the area of taxable arable land (which doesn't change) when farmers realize that grain production does not affect the amount of subsidies provided incentives to promote production will disappear. Most farmers do not know the exact amount of farmland being subsidized or the standard for calculating it so they accept the fact that the subsidy amount has decreased or remains unchanged. In addition, farmers in many areas sublease their land to other farmers but still receive subsidies. This is a common phenomenon. The above shows that crop production decisions are not associated with the subsidy amount. The role of direct crop subsidies and comprehensive agricultural inputs subsidies has shifted from boosting food production by the mobilization of farmers' enthusiasm for growing grain to purely income support for farmers. Others hold different opinions however. Yu et al. (2011) finds that these subsidies together with the abolition of China's agricultural taxes solicited increased grain outputs. Xu et al. (2012) confirm that reductions in China's agricultural taxes (similar to introducing subsidies) helped raise farm income through increased grain production responses via increased labour inputs, increased planting areas, and/or increased intermediate input uses. After reviewing the overall design and implementation of these subsidies, Yu

Table 14. Supply/Demand of major products of China in 2010 (thousand tons)

Product	Production	Import	Export
Wheat	115,180	1,231	277
Rice	195,760	388	622
Maize	177,250	1,573	127
Soybean	15,080	54,797	173
Cotton	5,960	2,840	6
Pork	50,710	902	214

Source: China Agricultural Development Report (2011).

and Jensen (2010) argue that such subsidies do influence production decisions at the aggregated level. Controversy still exists at home and abroad largely because of the policy implementation differences and lack of coordination when setting goals. However, there is reason to believe that China's agricultural domestic policy system will be more efficient and effective under the WTO framework with the help of continuous improvements and further reform.

China's green box support to the agricultural sector may continue to increase in future decades.

China is aiming for a type of sustainable economic development and an income for its people which would require society to pay more and more attention to agriculture and its sustainable development. Since the beginning of

the century China's agricultural support policy has undergone a complete transformation, especially with regard to the introduction of the four main subsidy policies. However, there are still quite a number of pending problems. As China's developing economy will offer more support towards the implementation of policy changes more extensive measures aimed at maintaining sustainable development will be further implemented. More courage and wisdom is needed to design and implement new policies. General goals for maintaining sustainable development - such as environmental protection, bio-diversity and measures on mitigating and adapting to climate change - are not included in current support mechanisms. Green box support may therefore further increase when these policies are implemented. In the future, with the development of the economy and overall national strength, more support will be provided to agriculture.

6. SUGGESTIONS TO IMPROVE CHINA'S AGRICULTURAL SUPPORT POLICY

Under the condition of complying with WTO regulations China needs to design a policy system which suits the characteristics of agriculture and the basic reality of its domestic conditions. It must also improve the effectiveness of implementing agricultural support policy and strengthen the long-term goals of promoting agricultural sustainable development.

Firstly, considering that current policies are extremely limited relating to sustainable development goals, China still needs to devote greater efforts to the further design and formulation of measures to promote and achieve the sustainable development of agriculture as soon as possible. These include mitigating and adapting to climate change, safeguarding biodiversity, and managing land and water resources. It should especially be thinking about balancing the multiple objectives of agricultural support policy.

Secondly, a focus on policy efficiency and the strengthening of the monitoring and evaluation of trade policy and its effects is needed. In accordance with WTO rules and its commitments China must also further improve the efficiency and effectiveness of policy supporting measures, and reduce the leakage and spillover effects due to information asymmetry, non-standard operation and rent seeking.

Last but not the least, policies need to be recognized by farmers in order that protecting the environment becomes a conscious behavioural trait and truly promotes sustainable

development. Farmers play a fundamental role in agricultural support policy. Only a comprehensive understanding and recognition of the role of peasants can effectively achieve policy objectives. Chinese farmers' current per capita income level is still very low. Most farmers are concerned about income which remains a top priority. As a result it is difficult for them to consider protecting the quality and safety of agricultural products, agro-ecological protection, or even raise awareness of the importance of such problems.

To this end, on the one hand, agriculture policy should strive to increase income levels so that farmers really benefit from domestic support policies and ensure farmers' capacity to take into account higher level policy objectives such as environmental protection. On the other hand, the process of policy design also needs to incorporate increased publicity and promotion efforts in order to let farmers realize the importance of such policies. When farmers attach importance to the realization of sustainable agricultural development and its values become incorporated into conscious behavioural norms it is then possible to truly realize the sustainable development of agriculture in China. This calls for greater wisdom to break through the current dual economic structure and to balance and coordinate agricultural support policies with China's economy, society and environment. Only when these different factors work together can policies become more effective and efficient.

ENDNOTES

- 1 Dualistic economic structure: an economic structure in which an urban economy with the characteristics of social production co-exist with a rural economy and small-scale production. The main characteristics of the dual economic structure of China are: an urban economy comprised mainly of modern industrial production whereas the rural economy is comprised mainly of small-scale agricultural production; the infrastructure in urban areas such as roads, telecommunications, health care and education are developed while those of the rural areas lag behind; the average income and consumption level of urban residents is much higher than that of the rural residents.
- 2 This poverty line refers to an independent standard used in China, i.e. per capita annual net income of 2300 RMB (339 USD).
- 3 In China the three major cereals refer to wheat, rice and maize.
- 4 The household registration system of China is the household population management policy which classes a household as a unit. China's households have two categories, agricultural households and non-agricultural households.
- 5 According to the National Bureau of Statistics of China, the Gini coefficient of Chinese national income is 0.479 in 2003, 0.491 in 2008 and 0.474 in 2012. Source <http://finance.ifeng.com/news/special/data201212/20130118/7574994.shtml>.
- 6 The Grain-to-green program is China's environmental protection program and refers to the conversion of cropland to forest and the conversion of grazing land to grassland. More details will be discussed in section 3.
- 7 Here 'mu' is a traditional unit of area used in China. One mu equals approximately 666.67 square meters and 15 mu is equal to 1 hectare.
- 8 The subsidy includes machines for mechanical tillage, planting and fertilizing, field management, harvesting, post-farm processing, irrigation, animal husbandry, aquaculture, power, and farmland capital construction.
- 9 A new socialist countryside is a part of the plan to build a "well-off society" in China, with the characteristics of developed production, "well-off" living standards, civilized local customs or manners, the clean and tidy appearance of village houses and democratic administration in rural areas of which the improvement of farmers' incomes is a key issue.
- 10 China-Africa agricultural cooperation is a good example of South-South Cooperation which is under the framework provided by the Forum on China-Africa Cooperation. The China-Africa Cooperation Forum is a South-South cooperation collective dialogue mechanism which was started in 2000 and holds ministerial conferences every 3 years. Areas of agriculture cooperation include land development, agricultural cultivation, cultivation techniques, food security, agricultural machinery and agricultural products processing. Cooperation also looks to expand agricultural technique cooperation, assist the establishment of agricultural technology demonstration centers, actively organize practical agricultural skills training, increase the dispatch of experts and technicians and provide opportunities to receive training in China. As of June 2011 China has established over 100 agricultural assistance projects and founded agricultural technology demonstration centers in 14 African countries. A few hundred agricultural experts have been sent to Africa to train large numbers of agricultural technicians. China has signed Agriculture and Fishery Cooperation Agreements with more than 10 African nations. In addition, the China-

Africa Development Fund has invested in more than ten projects with the total amount of investment reaching 57 million USD; the areas of investment include cotton, leatherworking, sisal hemp, sugar production and agricultural machinery.

Source: <http://baike.baidu.com/view/573266.htm>;

http://www.chinamil.com.cn/site1/xwpdxw/2009-07/02/content_1821828.htm;

http://www.tianshannet.com.cn/news/content/2012-06/01/content_6887260.htm;

http://intl.ce.cn/zgysj/201111/30/t20111130_22878120.shtml.

- 11 “Transfer income” refers to the receipt by rural households and their members of goods, services, capital or asset rights without giving or repaying accordingly, excluding capital provided to them for the formation of fixed assets. In general, it refers to all income received by rural households through redistribution.
- 12 Suppose the yield is 300 kg per mu, the prices only need to grow 0.06 RMB to increase the per capita income of farmers by 1 percent.

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