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Institutional Arrangement to Improve Farmers' Enthusiasm

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Abstract On the basis of summarizing theories related to public goods, with the aid of trend curve of China's annual grain yield from 1978 to 2010, in combination with grain policies at that time, empirical analysis is carried out on institution as key factor influencing the farmers' enthusiasm, showing that there is highly positive correlation between institutional change and grain production. In order to raise farmers' production enthusiasm and ensure the national grain security, this paper puts forward appropriate countermeasure systems from the point of view of innovating grain production policies. The countermeasure systems include: firstly, innovate agricultural operation institution; secondly, improve agricultural personnel cultivation mechanism; thirdly, complete financial investment system; fourthly, set up grain security protection system; and finally, build risk support system.

Key words Farmers' enthusiasm, Institutional arrangement, Grain security, China

Survey data from FAO shows that current grain supply is in a status of tight balance. The number of undernourished people in the world still rises. Grain price remains high. What's worse, this situation is aggravated by such factors as supply pressure resulted from deterioration of land resources, climate warming, as well as structure of consumption. Due to expansion of food demand, the global food security crisis remains unrelieved. There are composite factors influencing food security, including protection and improvement of natural resources, national food purchasing, comparative advantages of agriculture, agriculture investment policies, technical progress, trade policies, land property right, urbanization development, etc. All these factors exert a considerable effect on the balance between supply and demand of grain production. Among these factors, institution is an important one. The "institution" or "institutional arrangement" in this context is equal to "grain policy". Institutions are humanly devised rules, laws, moral and ethic norms to constrain individual behavior of pursuing principal welfare or maximal utility^[1]. Human behavior is often conducted under a certain institutional arrangement and organizational constraint. Different institutional arrangements have different effects on behavior of economic subject, as well as on economic performance and resource allocation efficiency. On the basis of basic principles of economics, this paper takes an analysis of grain security and governmental responsibility. It is intended to find out proper institutional arrangement that is able to raise farmers' enthusiasm, so as to fundamentally guarantee China's future grain safety and to boost sustainable development of China.

1 Theories related to public goods

Samuelson defines public goods as the goods whose con-

sumption by one individual does not reduce its availability to others. Grain is special product, and it has both private and public attributes^[2]. Besides, grain is quasi-public goods, and it has positive external effect, so it requires government to rectify^[3]. The essence of grain's positive externality lies in grain price not fully reflecting its marginal social benefit (MSB), leading to grain production hardly receiving average profit in society. This effect results in outflow of grain production profit, forming "scissors gap" between prices of industrial and agricultural products. Another consequence is that the social benefit of grain production is far greater than its economic benefit. For grain producing areas and farmers, the higher the grain production means the more output resources, the higher the opportunity cost, and the more drainage of farmers' interests. Therefore, out of consideration of "economic man", neither the government in grain producing areas nor farmers are willing to plant much grain. Increases in grain production fail to increase farmers' income but lead to drop of their income. In other words, increase of grain sown area leads to drop of income, while reducing the grain sown area brings increase of income. Such reverse change in the balance of increases of grain production and farmers' income severely impairs production enthusiasm of main producing areas, key distribution areas, as well as large grain production households^[4]. According to external economic theory, adequate compensation should be made for economic subject that has positive externality, to achieve internalization of external effect through rectification^[5]. This indicates that the government must increase subsidy for main producing areas and farmers through intervention policy, so as to elevate farmers' enthusiasm and heighten grain yield.

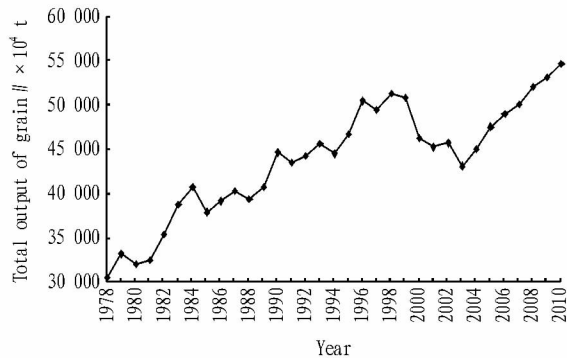
2 Empirical analysis on institution being key factor influencing farmers' enthusiasm

Production enthusiasm of grain farmers is a basic guarantee for the national grain security. In this regard, the institution

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is the key. There is a highly positive relation between institutional change and grain production. From the trend curve of grain output change, it is shown that policy guidance of grain production is fairly obvious. In other words, guidance of government directly affects production enthusiasm of grain farmers. For the change trend of China's annual grain yield from 1978 to 2010, see Fig. 1.



Note: data selected is from *China Statistical Yearbook*.

Fig. 1 Curve for change of China's annual grain yield from 1978 to 2010

Since the reform and opening-up, China achieves a rapid increase in grain production. Fig. 1 shows that the grain production undergoes five stages from 1978, and the reason for fluctuation is directly connected with national policies.

During 1978–1984, total grain yield rises stably. In 1982–1984, the total grain yield has an annual growth rate of 7.83%. From 354.50 million tons in 1982, it reaches 407.32 million tons. This time of grain output increase is mainly attributed to popularization of the household contract responsibility system and adjustment of grain price, which stimulates farmers' enthusiasm for grain production.

In 1985–1988, the total grain yield has an annual growth rate of -0.29%. In 1985, the annual grain output fell back to 379.110 million tons, decreasing by 6.9% as compared to the previous year. Sharp decline of grain output is resulted from the State's cancellation of preferential policy for partially encouraging grain production and from reduction of fund and material input. Besides, price of means of agricultural production has a rise of 4.8%, which greatly dampens farmers' enthusiasm for grain production.

In 1989–1999, the grain output steadily grew in the fluctuation. In 1989 and 1990, the annual growth rate of total grain yield is 6.45%. From 1991 to 1994, the annual growth rate of total grain yield is 0.04%. In 1996, the total grain output reached 504.53 million tons, having a growth rate of 8.13%. In 1997–1999, the fourth time of grain production fluctuation occurred, but the total grain output was still kept at 500 million tons. China implements market regulation policy for "keeping the output and loosening the price" of grain, establishes the grain purchasing price protection system, and allows all regions to make the lowest grain purchasing protection price or the price ceiling of grain sale.

During 2000–2003, China adjusted its agricultural structure

and lowered financial expenditure on agriculture. In this period, the grain output suffered from a continuous falling and dropped to the lowest 430.65 million tons from 523 million tons in 1998.

From 2004 to the present, China's grain output has a continuous increase. In 2004, it grew about 38.77 million tons as compared to the previous year, with an increase of 9.0%. In 2005, the total output of grain reached 484.02 million tons, which was 3.1% higher than that in the same period of last year. In 2006, China's grain yield was up to 497.46 million tons, increasing by 2.8%. In 2007, China's total grain output reached 510.50 million, increasing by 0.7%. In 2008, it was 528.50 million tons, 5.4% higher than that of the last year. These are mainly attributed to following reasons: since 2004, China started the rural tax and fee reform, reduced agricultural tax, increased financial input to grain production, provided direct subsidies for grain producers, general subsidies for purchasing agricultural supplies and subsidies for purchasing superior crop varieties and agricultural machinery and tools, and carried out rewarding policy for major grain-producing counties.

From analysis on fluctuation of total grain output, it is shown that farmers' grain production behaviour is under the influence of national policies. The regulation of price raising policy in 1979 stimulated farmers' enthusiasm for production. Besides, the reform of unified purchase and sales and establishment of double track system started from 1985 also played a positive role in raising farmers' enthusiasm. Therefore, change of national policies will affect direct interest of farmers, who will adjust their economic activities accordingly along with change of political environment. Currently, the State provides a lot of policies to support grain growing. However, the effect is limited, and basically only break-even price can be realized, which seriously suppresses farmers' enthusiasm for grain production.

3 Institutional arrangement to improve farmers' enthusiasm

Grain policy covers the production, circulation, domestic and foreign trade, as well as management. From the development situation of China's grain production, it is shown that agricultural production institution is a key factor influencing grain security and farmers' enthusiasm for production. Thus, the protection of grain supply level in the future should be turned to protection of grain production capacity. From the perspective of raising farmers' enthusiasm, this paper focuses on innovation of agricultural production policies, which are mainly in connection with agricultural infrastructure, scientific research, education, and technology popularization.

3.1 Innovate agricultural operation institution Good operation institution is favorable to stimulating farmers' enthusiasm for grain production. The innovation of China's production and operation system lies in realization of agricultural industrialization and improvement of organization level.

3.1.1 Vigorously promote agricultural industrialization operation. Small scale of household operation is an important factor influencing the quality of agricultural organization. Decentralized farmers swarming into market will lead to rise of circulation

cost. Agricultural industrialization operation can change such single household operation mode, make up for deficiencies of small-scale household operation, so as to realize appropriate scale operation and obtain scale economy and benefits.

3.1.2 Develop farmers' specialized cooperative organization. The development trend of agricultural modernization will inevitably require enhancing cooperation and combination of farmers and improving organization level. In this case, it is required to set up specialized cooperative organization, avoid dual risks brought about by nature and market. Such high organization level market entity will strengthen farmers' negotiating ability and proper asking ability when facing enterprises, consequently reduce drainage of interests and minimize market risks. The development of specialized cooperation mode for grain production should suit local conditions, so as to realize production cooperative operation.

3.1.3 Develop large backbone enterprises. The government should give support and safeguard, formulate preferential policies, foster a batch of closely associated backbone enterprises with standardization production, high ability of mobilization, and shared benefits with farmers, so as to realize trans-regional resource consolidation in the whole industry. Besides, it is required to cultivate and develop grain processing and trading enterprises, form a good many competitive large backbone enterprises, and bring into full play their leading and exemplary role. Finally, it is expected to form the operation mode of "enterprise + farmers' specialized cooperative organization + rural household" through the connection between rural household and enterprises.

3.2 Improve agricultural personnel cultivation mechanism Outstanding talents are the key to grain production and important factor for safeguarding grain safety. It is required to cultivate scientific talents and improve farmers' quality.

3.2.1 Develop vocational education. The government shall vigorously develop agricultural vocational education and training network, implement the grant policy in secondary vocational education, support key universities of agricultural science and technology, and set up and strengthen agriculture, forestry and water disciplines. For students of agriculture, forestry and water disciplines working for a certain years, it is recommended to provide compensatory policy for their national student loan during their study period. The objective is to cultivate a good many agricultural management, operation and technical talents suitable for modern agricultural requirements.

3.2.2 Formulate preferential policies. Government should formulate favorable policies to attract excellent talents to engage in agriculture, establish talent-oriented mechanism for those who are willing to devote themselves to modern agriculture. Talent policy making and allocation should be inclined towards rural areas. Moreover, good rural environment should be created to attract, cultivate, retain and make good use of talents. Also, it is required to provide good treatment and favorable working conditions for rural talents. Proper mechanism should be enhanced for exciting talents and fully stimulating their enthusiasm.

3.2.3 Cultivate modern farmers. It is required to enhance scientific and technological education and training for farmers,

promote their knowledge and technological renewal, improve their scientific and cultural quality, and foster new farmers who are capable of applying new technology to farming. In addition, modern thinking of farmers should be reinforced to adapt to demands of modern agriculture, fully grasp market information, have international view, and tackle essential problems of agricultural development. Meanwhile, function of policies, funds and excitation mechanism should be brought into full play, to speed up cultivation and guidance of pace-setters, able men and professionals in rural areas, finally to develop a batch of large grain producers who are capable, courageous and understand operation.

3.3 Complete financial investment system The government takes relevant responsibility for grain production. Thus, it shall increase the financial fund investment in agriculture, reform management system for financial fund investment in agriculture, improve utilization benefit of financial fund for agriculture, complete grain subsidy institution, and reinforce scientific and technical input, so as to quicken agricultural infrastructure and ecological engineering construction, increase direct investment in infrastructure, and raise agriculture comprehensive production capacity and sustainable development capability.

3.3.1 Increase grain subsidy. In developed countries, massive subsidies are provided for agricultural production. In EU, 40% finance is put to support agriculture. In the United States, the agricultural subsidy is 100 – 150 USD/hm², while in EU, this is about 250 – 350 USD/hm². In Japan, farmers' half revenues come from national subsidy^[6]. When China enters WTO, the upper limit of "De Minimis" is 8.5%, but the utilization of "yellow box subsidy" (actionable subsidy) is inadequate within actual standard. In 2007, China total output value of agriculture is 4 889 300 million yuan. According to standard, farmers can get 415 600 million yuan. Nevertheless, the subsidy in 2008 is only about 102 800 million yuan^[7]. In this situation, "yellow box subsidy" should be efficiently used to gradually increase input to grain year by year. It is possible to integrate general subsidies for purchasing agricultural supplies and subsidies for purchasing superior crop varieties and agricultural machinery and tools into one subsidy, and shift subsidy of circulation links to production links, so as to directly subsidize agricultural production. The direct allowance policy for grain focuses on major grain producing areas, key distribution areas and large-scale grain producers, to increase subsidy for them and guarantee the grain security.

3.3.2 Increase scientific and technical input into grain production. National policies should be continuously inclined towards agricultural science and technology, so as to raise research fund in agriculture. Financing system should be innovated to focus on the government with participation of many social forces. It is expected to realize continuous and stable scientific research increasing mechanism, and push on modernization of scientific research equipment, means and technology. Besides, public and basic scientific research input should be increased in agriculture and the reserves of science and technology for agriculture should be reinforced, to raise the ability of

agricultural scientific and technical innovation, improve and innovate agricultural technology popularization system, as well as to lift conversion rate of agricultural scientific and technological achievements into productivity.

3.3.3 Enhance agricultural infrastructure construction. Major factor restraining increase of grain production lies in weakness of agricultural infrastructure. Inadequate input is the root cause for weakness of agricultural infrastructure in China. Thus, construction input must be carried out. In financial investment, it is required to strengthen government service function, adjust the financial expenditure structure, and make inclined policies towards to agriculture, to ensure increase of total investment in agriculture and rural areas. Investment in fixed assets within the budget should be inclined towards agricultural and rural infrastructure construction, to guarantee further increase of total amount and proportion. Under the guidance of government, fund raising should arouse enthusiasm of individual, collective and society and be put into agricultural infrastructure construction. Emphasis should be placed on encouraging financial institutions to increase medium and long term credit funds for agricultural infrastructure construction, and guiding financial institutions to strengthen credit expenditure in agriculture. The proportion of loan increment should not be lower than the previous year, and the speed increase should not be slower than that of other loans in the same period.

3.4 Set up grain security protection system American economist Willis L Peterson believes that if farmers in developing countries get favorable price, the agricultural output may be 40% – 60% higher than the actual situation, and national income may increase over 3%^[8]. At the same time, it requires us to stabilize and properly raise grain purchasing price, adjust the price of agricultural production means, improve benefits of grain production, and ensure profit margin of farmers' grain production.

3.4.1 Complete the lowest purchase price. On the basis of cost-benefit conditions of farmers' production, we are to determine the lowest purchase price and highest intervention price, and then refer to market price of grain and farmers' next grain production plan. The lowest line for ensuring income of grain producers is to specify the lowest price for grain purchase. When the market price is higher than this lowest price, grain producers can freely sell their grain at the market. On the contrary, the State should purchase at the guaranteed lowest price and implement necessary price support.

3.4.2 Establish the lowest purchase price operation system. China Grain Reserves Corporation and local grain reserves companies, as the operation main body, should carry out throughput operation according to fluctuation of grain price at the market, to stabilize grain price and relation between supply and demand, prevent " farmers suffering from low price of grain" , and guarantee farmers' benefits.

3.4.3 Adjust and control rise of production means. The government shall adjust and control continuing rise of production means price by policy measures, such as policy of tax refund and subsidy for production enterprises, to cut down production cost of agricultural means production enterprises. In addition,

industrial production with speculative activities should be seriously punished, to control cost of grain production and ensure farmers' receiving comparative benefits.

3.5 Build risk support system Under influence of natural conditions and market, grain production has a high risk level. Accordingly, farmers will suffer various losses. What's more, farmers cannot pay high premium with low income. In addition, farmers may have fluke mind of natural disaster. This leads to lack of risk awareness. Consequently, the rate of insurance coverage is low, and the farmers' insurance rate is less than 0.5% in whole China^[9]. It is required to implement grain crop insurance and disaster loss insurance, reduce farmers' grain production risks. Meanwhile, risk prevention mechanism should be set up to prevent floods, droughts and plant diseases and insect pests, and to improve farmers' ability of defending against natural and market risks.

3.5.1 Strengthen government functions. China's agricultural insurance operates in accordance with laws. Besides, it is required to clearly specify functions and actions of government in agricultural insurance, and enhance government intervention support. In western countries, there is fresh experience. For example, Canadian *Crop Insurance Act* stipulates that farmers can pay only 50% of the premium, without the need of delivering any administrative fees, and the rest premium will be assumed by the government and agricultural insurance groups. In the United States, the premium subsidy is slightly different due to insurance types. The average subsidiary amount is 53% of net premium in 2000. Among these, the rate of allowance for many types of crop insurances and revenue insurances is 40% , and catastrophe insurance will be subsidized for full amount^[10]. It is essential to enhance policy support at all financial levels, implement low premium and high subsidy policy, and provide favorable taxation policy for agricultural insurance business in insurance company, so as to reduce risks of farmers and insurance companies.

3.5.2 Improve operation strategy of agricultural insurance company. We should establish the commercial agricultural insurance system based on policies of the state, grant interest subsidy to financial institutions, and incorporate insured farmers into coverage of protection and compensation by encouraging insurance companies to engage in business of agricultural insurance and expanding business scope of agricultural insurance.

3.5.3 Establish catastrophe risk fund. We can raise the funds relying on government appropriation, and contributions from agricultural insurance company or reinsurance company and authorities for civil affairs and water conservation, or by issuing agricultural insurance bonds. The insurance company and farmers suffering from a catastrophe are granted compensations from the fund to some extent. We should also support setup of research agency for agricultural disaster to reinforce capability to withstand risks^[11]. We can institute agricultural reinsurance mechanism based on the national catastrophe fund, through which the main body engaging in agriculture enjoy subsidy for reinsurance premium.

addition to the widespread uses of fertilizer, the deteriorated farmland and most of seeds fostered to meet the conditions of farmland are useless to seed which of course increases the costs of farmland. Therefore, the choices of life are facing a difficulty which is difficult to get rid of from a perspective context of intensification.

3.2.2 Diversification. In the context of risk society, diversification makes individual farmer get rid of village community in a period, or be devoid of family, disclosing themselves to the outer risks completely which are reflected on many aspects. Firstly, because of the comparatively lower level of education, farmers can only take a part time job in physical labour jobs which is not beneficial to improve skills, but deepens the dependence on simple physical jobs and low salary for those who are in a worse competition. Secondly, because the diversification is seasonable, so it is soon withdrawn after a short entry and weak adaption which is difficult to accumulate social capital and a part-time job becomes unsteady. So, in term of context of risk society, diversification faces difficulties which are difficult to get rid of.

3.2.3 Migration. Because of the flows of profession and space, the social behaviours, or the individual farmers are separated firstly from village community and reasons of behaviours are weakened. Therefore, with the losses of traditional community network and individual behaviour, the individual admission faces challenges. Just as what said of Gidence, the migration of farmers actually the newly generated crisis in a more complicated society when the trust is lost in the original one^[7]. In fact, most individual farmers migrant to another new place, because of the low educational level, the vocational choices are at low levels and at the same time, they are pushed out culturally and politically. They are also pushed out in economy. In a word, they are marginalized by difficulties.

4 Conclusion and suggestion

The development disparities between rural areas and urban areas in marketing economy and the difficulties of life choices not only should adopt the method of upgrading the purchasing prices of crops to solve it, but also should make a self-reflection on the risks of policies brought from a perspective of risk

society. All of which should be improved and perfected from the following aspects and deal with risks of life. The first is to realize the reasonable distribution of public resources and gradually narrow the gap between urban areas and rural areas. The second is to strengthen the construction abilities, including affording the corresponding skill training and vocational training; the third is to establish a complete marketing information scattering systems to cut down the marketing costs of farmers; the fourth is to try to construct the production insurance system to cut down the management costs of farmers. Then, in the educational and vocational competition and flows mentioned by Beck, farmers are capable of being the main body of market competition and getting rid of the difficulties of making choices about life.

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