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Current Situations and Recommendations for Non-grain Tendency of Farmland in Anhui Province

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Abstract This paper firstly sorted out current situations of farmland protection and increasingly significant non-grain of farmland in Anhui Province in recent years. Then, it made an in-depth analysis on causes for non-grain problem, and analyzed adverse influence on national grain security. On this basis, it came up with recommendations for alleviating non-grain problem of farmland in Anhui Province: strictly protecting capital farmland, reasonably guiding distribution and scale of grain production; treating non-grain problem of farmland according to specific situations; reforming and improving grain subsidy policy; establishing a new agricultural land circulation mechanism with family farm as subjects, other types as supplements, and access and supervision system as guarantee.

Key words Farmland protection, Non-grain, Land circulation, Structural adjustment, Anhui Province

1 Introduction

Farmland is essence of land and the foundation of grain production. Farmland is not only essential agricultural means of production, but also important material condition for stabilizing economic and social order, guaranteeing grain and ecological safety, and promoting coordinated urban and rural development. Both Party Central Committee and the State Council attach great importance to farmland protection. Leaders of the party and the state have stressed many times that: The bowls of the Chinese, in any situation, must rest soundly in our own hands. Our bowls should be filled mainly with Chinese grain. Only when a country is basically self-sufficient in food, can it take the initiative in food security and grasp the overall situation for economic and social growth^[1]. And it is required to implement the most strict farmland protection system and grasp the relation between economic development and farmland protection. To carefully implement decision and deployment of the party and central government, Anhui Provincial Committee and People's Government take energetic measures to stick to the farmland red line and ensure stable farmland area and increasing quality of farmland. However, with acceleration of industrialization and new urbanization in Anhui Province, the non-grain problem of farmland is increasingly outstanding and urgently needs close attention.

2 Current situations of farmland protection and non-grain problem in Anhui Province

2.1 Current situations of farmland protection In recent years, Department of Land and Resources of Anhui Province ac-

tively implements farmland protection policy, takes energetic measures, which brings significant achievements of farmland protection in the whole province.

(i) Strengthening measures and implementing the most strict farmland protection system. Firstly, according to overall deployment of the state, it completes annual farmland protection responsibility target assessment at city level and counties under the direct control of provincial government, submits *Report on Self-examination of Farmland Protection Responsibility Target Assessment*, the provincial level, city level, county level and township level sign the target responsibility statement annually, and the provincial farmland protection target is effectively implemented. Secondly, with approval of provincial government, it issued *Measures about Off-office Auditing for Farmland Protection Responsibilities of Leaders of Anhui Province (for Trial Implementation)* ([2015] No.2) jointly with the Auditing Department of Anhui Province, which provides powerful gripper for further strengthening farmland protection. Thirdly, it further reinforces preliminary review of construction land and establishes field survey system for preliminary review of construction land projects. Fourthly, it carefully implements annual land change survey and law enforcement inspection, resolutely investigates illegal occupation of farmland, and strengthens patrol inspection of capital farmland area. Fifthly, it annually uses Earth Day (April 22), Land Day (June 25), and Free Legal Advice Day (December 4), to propagate farmland protection and capital farmland protection work in The Chinese Newspaper of Land and Resources, Anhui People's Radio Station, and Anhui People's Television Station.

(ii) Giving top priority to key points and energetically promoting integrated rural land consolidation. Since 2001, Anhui Province took 5 national level and 19 provincial level capital farmland protection demonstration areas, and 20 high standard capital farmland demonstration counties as key projects, to promote rural land consolidation demonstration construction project, national and

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provincial investment land consolidation projects, high standard capital farmland construction projects, and energetically promote rural land consolidation. By the end of 2014, it had established 21.1 million mu high standard capital farmland, consolidated 5270 old villages, built 170 new villages, and vacated 108000 mu construction land. The new and improved farmland irrigation area reached 15 million mu, new and improved farmland flood prevention area reached 5 million mu, and water loss and soil erosion control area reached 5 million mu. It has realized integrated consolidation of field, water, road, forest, and villages and effective improvement of field roads and water conservancy facilities, the farmland improvement grew 1-2 level, and productivity increased 10-20%. The average mechanized farming percentage in the project area was up to 95%, it improved agricultural productions and increased agricultural production efficiency.

(iii) Improving measures and laying equal stress on increasing farmland quantity and improving farmland quality. The Department of Land and Resources of Anhui Province constantly improves measures and strengthens management of farmland increase project on the principle of farmland protection first and laying equal stress on quantity and quality. Firstly, it has incorporated reclamation and consolidation of farmland into annual land use plan target, strictly implementing farmland supplement task and making the management of farmland supplement project more detailed. Since the twelfth five-year plan period, Anhui Province has completed the task of supplementing farmland 1.125 million mu, and realized balance of farmland occupation and supplement for 16 consecutive years. Secondly, it enhanced feasibility study, project establishment, plan and design, budget, review and demonstration, project bidding and tendering, construction supervision, fund supervision, and information disclosure, and actively implemented *Notice of the Ministry of Land and Natural Resources on Enhancing Implementing the Most Strict Farmland Protection System* ([2014] No. 18). Thirdly, Anhui Province issued specific measures for compensated regulator of farmland supplement at provincial, city and county levels, and measures for supporting key construction projects to implement farmland occupation and supplement balance. It made clear that 800 billion yuan railway investment project can be firstly built then supplemented, which greatly supports implementation of railway construction projects in Anhui Province and receives high opinion of land user entities.

(iv) Unifying standards and strictly sticking to the permanent capital farmland protection red line. According to requirements of the *Notice on Further Strengthening Division of Capital Farmland* ([2014] No. 128) issued by Ministry of Land and Natural Resources and Ministry of Agriculture, on the basis of division of permanent capital farmland, as per the second national land survey, latest annual land use change survey, overall land use plan, land consolidation planning, national farmland quality evaluation, county-wide farmland fertility survey and quality evaluation results, on the principle of firstly protection and then laying equal stress on quantity and quality, Anhui Province strictly divided the

permanent capital farmland protection red line. High quality farmland likely to be occupied around towns and along traffics should be firstly divided into permanent capital farmland, to maximally ensure integrated grain production capacity and guarantee stability of farmland area and national grain security.

(v) Enhancing supervision and constantly improving quality of reclaimed farmland. In recent years, Anhui Province constantly strengthened land reclamation in urban and rural construction land, industrial and mining waste land, and land consolidation in coal mining subsidence area, to ensure the quality of farmland after consolidation not lower than new farmland quality. Firstly, conducting farmland quality evaluation work. To improve farmland quality, in planning and design stage before implementation of land consolidation, it urged county-level land and resource departments to carry out farmland quality evaluation, to realize consistency between reclaimed farmland quality and surrounding area farmland type and quality, and the farmland quality after consolidation not lower than new farmland quality. Secondly, improving farmland quality level. It strictly reviewed land reclamation scheme of various land consolidation projects, required that various land consolidation projects should combine surrounding land types and farmland quality situation, and reasonably determined land reclamation direction on the basis of carrying out water resource balance analysis and land suitability evaluation, forbidding reclaiming land with slope greater than 25 degrees to farmland; also, combining surrounding irrigation, drainage facilities, and field road availability, it optimized farmland water conservancy and field road project and improved farmland quality level. Thirdly, guaranteeing safety of reclaimed farmland. According to characteristics of various land consolidation projects, especially reclamation and use of industrial and mining waste land and village relocation projects in mining subsidence area, according to terrain, landform, and situations of subsidence area, it ensured project area safety, soil free from pollution, and various physical and chemical indicators meet requirements, strictly implemented soil replacement source and soil modification measures of arable layer, and practically guaranteed quality and safety of reclaimed farmland.

2.2 Current situations of farmland "non-grain" tendency

By the end of December 2014, the land circulation area in Anhui Province had reached 33.9314 million mu, including 25.417 million mu farmland, accounting for 41.09% of total farmland area of Anhui Province. In this, more than 85% is capital farmland and more than 60% is large scale circulation. Capital farmland circulated in large scale is still mainly planting grain crops, but the non-grain proportion is gradually increasing. Some new agricultural operating entities use circulated farmland to plant higher income economic crops, engage in breeding industry and other non-agricultural operating activities. These have changed uses of capital farmland and violate related provisions of the state about capital farmland protection. Due to excessive pursuit for market profit and land output rate, circulated farmland in some grain production areas is changed to breeding industry, high efficient economic crop

planting industry, ecological agriculture, and leisure agriculture.

3 Main reasons for non-grain tendency of farmland in Anhui Province

3.1 Relatively low comparative income of grain planting

This is the most direct and fundamental reason for non-grain tendency of farmland^[2]. Anhui Province is a large grain production province, and planting is still a major channel of farmers' income. According to the present agricultural production benefits, grain crop production not only requires great effort, but also has net income lower than planting other industrial crops and breeding. Therefore, considering cost and profit, agricultural operators are likely to plant industrial crops, develop high efficient agricultural products such as livestock and poultry, or develop facility agriculture, sightseeing agriculture and tourist agriculture. All of these will inevitably lead to non-grain tendency of farmland.

3.2 High rent in the process of land circulation In recent years, with reduction of young and middle-aged labors and popularization of advanced agricultural machinery in rural areas, the speed of farmland circulating to new agricultural operating entities through land circulation is accelerating. According to statistics, during 2011-2014, the annual growth rate of farmland circulation in Anhui Province reached 31.7%. With acceleration of land circulation process, circulation expenses also rise rapidly. In northern Anhui, the annual rent is up to 1000-1200 yuan/mu, while in southern Anhui, it is 600-800 yuan/mu. This price is difficult to bear for farmers relying on planting grain. Thus, they have to seek more profitable ways, such as planting industrial crops or developing livestock and poultry breeding. In addition, more industrial and commercial capitals flow to rural areas and participate in land circulation. Compared with farmers, they have higher funds, technologies and management advantages, and such high rent assists them in renting land of farmers. However, due to influence of seeking profit, when income from planting grain crops is low, they will plant industrial crops with higher added value, which will be easier to be supported by local government as characteristic agriculture.

3.3 Adjustment of agricultural production structure In recent years, to develop rural economy and increase farmers' income, many areas start to adjust agricultural production structure. It takes on the trend of expanding industrial crop production as leading production, and the non-grain tendency is increasingly significant. Since inhibiting rural farmland non-grain tendency is mutually restraint with urban construction, local economic development and farmers' income increase, many local governments generally indulge non-grain action for the consideration of local economic development or political performance. They will not make effort to regulate non-grain action. As a result, the non-grain tendency is not effectively stopped.

3.4 Stressing economic development, but belittling farmland protection According to current situations, due to pressure of developing economy, all areas attach great importance to devel-

opment but belittle farmland protection. From the perspective of the masses, farmland protection should submit to income increase. As long as income is increased, the masses do not care the purpose of farmland; from the perspective of local government, to speed up economic development, especially in some underdeveloped areas, inviting investment is always major work of government. As a result, it will inevitably occupy partial farmland to develop industry and commerce, leading to non-grain tendency of farmland and even the non-agricultural tendency.

3.5 Vacancy of supervision mechanism Firstly, supervision subjects are not clear. At present, land use purpose is managed mainly by department of land and natural resources partly assisted by agricultural department. However, in practical production, due to unclear responsibilities, the management remains the state of post supervision. Secondly, supervision of circulation land lacks legal basis. Now, land circulation management accords with Land Management Law, which only limits non-agricultural problem of land circulation but there is no provision on supervision of non-grain problem. There is no specific supervision measure, so it is difficult to supervise circulation land use purpose in practice.

4 Farmland non-grain tendency and grain security

Farmland quantity is the precondition for grain security and farmland quality is foundation stone for grain security^[3]. Grain security includes quantity security and quality security, and grain security concerns national security and stability.

4.1 Drop of total grain yield threatens grain security Non-grain tendency of grain is not resulted by a single reason. Thus, the consequent results are also not single and small range. In the action of chain effect, its adverse effect on grain production will double. Since large scale planting of industrial crops will bring higher income, more farmers will choose to give up grain production, and then they will change to higher income industrial crops. When the per unit area yield is fixed, the drop of grain sown area will inevitably lead to decline of grain yield. At the existing scientific and technological level, the per unit area yield of grain will not be increased greatly. Thus, it can be predicted that reducing grain sown area will threaten normal grain production and accordingly lead to crisis of grain security.

4.2 Decline of farmland health level threatens grain security

With involvement of industrial and commercial capitals, large area of farmland has been occupied by various types of leisure agriculture, picking gardens and agritainment, accompanied with large area of pollution. On the one hand, enterprises will excessively use pesticides, chemical fertilizers, and ripening agents detrimental to soil quality, to ensure ornament plants, flowers, fruits; on the other hand, concentration of large population will generate much waste gas and water. Once such waste gas and water penetrate into soil and accumulate in soil, and transmit to surrounding fertile farmland through water cycle and air, they will be finally absorbed by grain crops. Damage of grain production environment will result in failure to guarantee grain quality and even

lead to unretrievable tragedy. Therefore, non-grain tendency of farmland is not only detrimental to protection of ecological environment, but also threatens grain quality and security.

4.3 Decline of grain self-sufficiency level concerns national security According to national grain production data issued by State Statistical Bureau in December, 2015, the total grain yield of China was 621.435 million tons in 2015, which was 14.408 million tons more than 2014, showing China has realized grain yield increase for 12 consecutive years^[4]. However, China's grain import is still increasing year by year, and the import varieties expand to wheat, maize and rice, China is becoming the first grain importer in the world. We are anxious about this. Increase in net import of grain indicates constant increase in dependency on foreign grain. For a large population country, if grain self-sufficiency can not be guaranteed in increasingly serious non-grain problem, national security and stability will be threatened.

5 Recommendations for non-grain tendency of farmland in Anhui Province

5.1 Strictly protecting capital farmland and reasonably guiding distribution and scale of grain production In accordance with requirements of "complying with laws, guaranteeing quality, improving quality, and fulfilling down to farmers", it is recommended to carefully carry out capital farmland division and database construction, strictly implementing capital farmland protection responsibility, and ensure no reduction of farmland area, no change of farmland use purpose, but improvement of quality. Besides, it is recommended to promote provincial grain core production area and reserve area construction, to make them become foundation ensuring grain security. Government should make scientific planning, reasonably guide grain production of these regions, and provide preferential policies for farmland water conservancy construction, agricultural technologies, and finance.

5.2 Treating non-grain tendency of farmland differently Firstly, it is required to realize nutrients essential for life activities come not only from grain crops in traditional sense, but also from meats, eggs and milk products and aquatic products. Therefore, we should constantly deepen understanding about connotation of grain. In other words, things that can guarantee our well eating can be deemed as foods. Instead, we should not just pursue grain quantity, we should reasonably allocate proportion of various new grain varieties. Therefore, agricultural operators should adjust planting structure in accordance with local situations on the condition of not damaging farmland and capital farmland, and government should not intervene and should bring into play decisive role of market allocating resources, such as planting vegetable, strawberry, and forage grass. Once the market is saturated and rice and wheat price is increased, agricultural operators will consciously adjust planting structure. Nevertheless, it is required to forbid agricultural operators to use arable land and farmland to dig fish ponds, build orchards, and nursery gardens.

5.3 Reforming and improving grain subsidy policy It is

recommended to further increase support for large scale grain production, and the core is to solve the price scissors between grain planting benefits and other industrial crop planting or breeding benefits. Apart from raising existing grain subsidy level, it is recommended to pay attention to following two points. (i) Enhancing pertinence of grain subsidy: subsidize grain production instead of farmers, to really benefit grain production, especially large grain planting farmer households and other new agricultural operating entities, and subsidy should be classified and carried out as per the degree of scale. (ii) Changing "yellow subsidy" to "green subsidy": it is recommended to change monetary subsidy to price support policy, technology subsidy, agricultural machinery and means of agricultural production subsidy^[5].

5.4 Establishing a new agricultural land circulation mechanism with family farm as subjects, other types as supplements, and access and supervision system as guarantee An optimal merit of family farm is moderate scale. Since investment ability is limited, it is difficult to develop high grade facility agriculture. To prevent agricultural sacrifice, majority of family farms conduct grain production. Besides, resource endowment of China determines that agricultural modernization should not adopt development modes of North American countries, and should not adopt dual development mode in Latin American countries. Instead, China should develop characteristic modern agriculture in accordance with national conditions, namely, ensure subject entities of farmer household contractual operation in the process of land circulation. It is recommended to attract company entities to flow to agricultural land and become agricultural operating entities, and make farmers become agricultural workers. Rural land circulation is a manner not a direction. Therefore, it is required to set high threshold and only allow powerful enterprises to fight for farmland operating right with weak farmers. The *Decision at the Third Plenary Session of the Eighteenth Party Central Committee* stated that it is required to encourage and guide industrial and commercial capitals to rural areas for developing modern planting and breeding industries suitable for enterprise-like operation. However, this does not mean allowing all enterprises to invest in agriculture. Specifically, agricultural land circulation should set conditions and prevent a new round of predation of rural land resources. Therefore, it is required to establish land circulation access system to ensure unchanged land use purpose and high efficient use.

The core part of land circulation access system is qualification certification of land circulators, including credit conditions, operating ability, and management level, etc. It is recommended to regulate land use action of land circulators, ensure no change of land use purpose, constantly increase of land use benefits, and cultivate a good many family farms through land circulation, to provide powerful guarantee for promotion of urbanization. The supervision system is to supervise land use purpose and operation level. When any action in violation of planned use or low benefit, it is required to take such punitive measures as warning, rectifica-

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Table 5 Reclamation direction and land type area

Unit: ha

Region	Reclamation direction			
	dry land	paddy fields	woodland	Total
Biqian Township, Yilong County, Nanchong City	0.0000	0.4442	0.1356	0.5798
Rixing Town, Yilong County, Nanchong City	0.1183	0.2221	3.8599	4.2003
Shuangqing Township, Yilong County, Nanchong City	0.0248	0.7892	1.7816	2.5956
Wufu Town, Yilong County, Nanchong City	0.0150	0.0223	0.8811	0.9184
Total	0.1581	1.4778	6.6582	8.2941

6 Conclusions

The damaged land reclamation and use in Youfanggou Reservoir can promote intensive land use, and achieve socio-economic and environmental sustainability, in line with national land management policies, which can provide a reference for land resource management and ecological restoration. 3.7165 ha of land is temporarily occupied in Youfanggou Reservoir, that is, the damaged land area is 3.7165 ha; the reclaimed land area is 3.7165 ha, with reclamation rate of 100%. Before reclamation, the reclamation area occupies 2.6681 ha of dry land, 0.9925 ha of woodland and 0.0559 ha of ponds; after reclamation, the overall structure of land use is changed. After the land-use nature of damaged temporary land is restored in Youfanggou Reservoir by taking reclamation measures, it will achieve good economic, social and environmental benefits. Therefore, from the perspective of land reclamation, the reclamation project is feasible.

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tion, fines, and taking back circulated land, to ensure agricultural use and high efficient use of agricultural land.

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