Research on Scientifically and Rationally Promoting the Fallow of Cultivated Land under the Strategy of Rural Revitalization

Ai MA[1,2,3], Jun ZHENG[1,2], Jiafeng YU[1,2,3]*

1. College of Economics and Management, Yangtze University, Jingzhou 434023, China; 2. Yangtze River Delta Economics and Social Development Research Center, Yangtze University, Jingzhou 434023, China; 3. Hubei Rural Development Research Center, Jingzhou 434023, China

Abstract Implementing the rural revitalization strategy is an important decision-making arrangement made by the party's 19th National Congress, and is the general grasp of the work of "agriculture, rural areas and farmers" in the new era. In rural development, the issue of cultivated land is an important way to promote poverty alleviation in the vast rural areas and build a well-off society in an all-round way. In combination with the fact that the current quality of cultivated land resources in China is not high and the basic fertility has been continuously declining caused due to pollution, China must promote a scientific and rational system of arable land fallow to ensure the further development of agricultural modernization in China. In the process of researching the implementation of the arable land fallow system, the problems of land abandonment and "non-agriculturalization" after farmland fallow, the willingness of farmers to fallow and the subsidy for farmland fallow have been discovered. In response to the problems above, corresponding policy recommendations are put forward in order to better promote the process of arable land fallow and poverty alleviation in China.

Key words Rural revitalization, Arable land fallow, Agricultural modernization, Poverty alleviation

1 Introduction

The report of the 19th National Congress of the Communist Party of China clearly stated the implementation of the "Village Revitalization Strategy", that is to say, insisting on the priority development of agriculture and rural areas is the common will of the whole party. In agricultural production, land is the foundation and the protection of the land is particularly critical. But in recent years, in the process of development of China's agriculture, there have been some problems with the use of land. Excessive reclamation and predatory development of land have led to a series of problems such as general decline in the agricultural land, ecological environment destruction, soil erosion, biodiversity reduction and unsustainability of agricultural development. In rural development, the issue of cultivated land is an important way to promote poverty alleviation in the vast rural areas and build a well-off society in an all-round way. Therefore, in the context of rural revitalization, rural land fallow is imperative.

2 Literature review

A large number of theories and practice in developed countries have proved that promoting the fallow system of cultivated land has a very positive significance. Zheng Zhaoshan believes that promoting the fallow system of cultivated land is conducive to balancing the supply and demand of food in China, reducing China's fiscal pressure and accelerating the process of agricultural modernization[1]. Chuai Xiaowei *et al.*[2] believe that during the process of propelling cultivated land fallow, the possible problem of food production reduction can be solved in terms of increasing investment in science and technology, updating and improving varieties of agricultural products, and strengthening the construction of agricultural infrastructure. After learning from the US arable land fallow protection plan, it is believed that the mechanism and concept of ecological compensation in the United States is worthy of reference in China's work of promoting farmland fallow[3]. Lin Li *et al.*[4] believe that in view of China's existing national conditions, China's arable land fallow should be intervened mandatorily by the government at an early stage, and then in the case of mature ecological compensation practices, the mandatory intervention is transformed into induced intervention using the operating mechanism of the market. Wang Xiaoli[5] believes that China should learn from the US's ecological compensation model, consider the main will of farmers, adjust the compensation indicators according to actual conditions, and formulate appropriate compensation mechanisms. Zhang Huifang *et al.*[6] believe that promoting the fallow system of cultivated land will help to maximize the benefits of China as a whole and the individual farmers, and provide three fallow models that can be used for reference: seasonal fallow, "transfer + fallow" and fallow plan. Liu Jingnuan *et al.*[7] believe that the basic fertility of the land is the basis of agricultural output, the calculation of the basic fertility of the land since the founding of China shows that China's current basic soil fertility has been reduced to a very dangerous node, and it is necessary to promptly adopt an active farmland fallow protection system to pro-

Received: July 2, 2019 Accepted: August 4, 2019
Supported by Major Project of National Social Science Fund (15ZDA020); Open-ended Fund of Yangtze River Delta Economics and Social Development Research Center (CJKF-2017-06); Social Science Research Project of Yangtze University(YS2018027).

* Corresponding author. E-mail: 1482818004@qq.com

tect the ecological security of cultivated land and food security. China should learn from the experience of foreign countries that have a farmland fallow protection system and a relatively complete system, fully respect the farmers' willingness, actively protect the farmers' rights and interests, do a good job in subsidizing agricultural fallows and strengthen the management of fallow farmland, thereby further enhancing agricultural competitiveness[8]. Zhuo Le *et al.* [9] believe that China currently faces a "three highs" pattern of high grain output, high inventories and high imports and serious destruction of cultivated land resources, and therefore on the basis of studying the construction of fallow systems in Western countries and some regions, China should implement the fallow system as soon as possible. Through the above literature review, it is concluded that relevant scholars have conducted many studies on the rationality and feasibility of propelling land fallow on the basis of drawing on the land fallow in developed countries and regions, but there are still few studies on how to implement an effective land fallow system in combination with the actual conditions of China. Taking this as an entry point, problems and countermeasures of the land fallow system are studied in this paper.

3 Current situation of cultivated land under rural revitalization

3.1 The overall quality of cultivated land being low According to the state of China's cultivated land quality announced by the Ministry of Land and Resources in 2015, the proportion of high-quality cultivated land is less than 2.9% of the total cultivated land in China. Moreover, in the national total area evaluated, the area of medium and low-quality arable land accounted for more than 70.5%. In the more than 30 years since reform and opening up, along with the process of urbanization and industrialization, a large number of agricultural land in China with convenient transportation, flat terrain and high soil fertility has been occupied by various constructions. Although China adopts a policy for balancing occupation and compensation, on the operational level, the newly compensated cultivated land is mostly low-yield farmland with inconvenient transportation and poor soil fertility. In the long run, the area and proportion of high-yield and high-quality cultivated land in China have been decreasing, but the area and proportion of low- and medium-yield cultivated land are rising. In summary, the overall quality of cultivated land in China is currently low, and it is urgent to develop corresponding farmland protection measures to improve the quality of cultivated land.

3.2 A large amount of cultivated land being polluted The current serious situation of cultivated land pollution in China is mainly caused by that the industrial enterprises arbitrarily discharge "three wastes" in production and management activities in the process of economic and social development. At the same time, in China's long-term agricultural production and management activities, farmers unilaterally pursue the maximization of production and invest heavily in agricultural products such as fertilizers, which has also caused pollution of cultivated land to a large extent. To this end, this paper counts the use of manure, agricultural nitrogen fertilizer, agricultural phosphate fertilizer, and agricultural potassium fertilizer in China from 2007 to 2017 (Table 1). As shown in Table 1, China's agricultural production is currently in extensive management, and extensive use or even abuse of pesticides and fertilizers in production has resulted in serious pollution of cultivated land, further directly leading to a decline in the basic fertility of cultivated land. Although the use of pesticides and fertilizers has decreased since 2015, the large amount of pesticides and fertilizers used is still one of the factors that restrict the development of China's agriculture to modernization. First, in the long-term use of pesticides on land, it will directly lead to an increase in harmful residues in the soil, directly affecting the quality of agricultural products; and the spatial clearance of soil will also shrink, leading to soil compaction, which is not conducive to the sustainable development of agriculture. Second, China's chemical fertilizers are in an over-used and even abused state in agricultural production, causing many adverse effects that are not conducive to the sustainable development of agriculture.

Table 1 Statistics on application amount of fertilizers in China during 2007 – 2017 10^4 t

Year	Manure	Nitrogen fertilizer	Phosphorus fertilizer	Potassium fertilizer
2007	5 108.00	2 297.21	773.02	533.62
2008	5 239.00	2 302.88	780.08	545.20
2009	5 404.40	2 329.90	797.70	564.30
2010	5 561.68	2 353.68	805.64	586.44
2011	5 704.24	2 381.42	819.19	605.13
2012	5 838.85	2 399.89	828.57	617.71
2013	5 911.86	2 394.24	830.61	627.42
2014	5 995.94	2 392.86	845.34	641.94
2015	6 022.60	2 361.57	843.06	642.28
2016	5 984.00	2 310.50	830.00	636.90
2017	5 859.00	2 221.82	797.59	619.74

3.3 The fertility of arable land being declining According to the data released by the National Bureau of Statistics, the annual growth rate of China's grain output since 2000 is calculated and plotted (Fig. 1). As shown in Fig. 1, China's annual growth rate of grain output fluctuates greatly. Even in 2016, there was a negative growth, declined by 0.835% year-on-year. In addition, in 2013, according to the analysis on data of monitoring points nationwide by the Ministry of Agriculture, in the past decade or more, China's basic soil fertility has dropped by about 5%. What is revealed behind these data is the disorderly predatory development of arable land. At present, the current situation of agricultural production in China is to increase the amount of land fertilization to maintain the high output of the land. Fundamentally, this extensive agricultural production model has destroyed the original ecological level of cultivated land to a great extent, thus reducing the fertility of the cultivated land. Undoubtedly, when the basic fertility of soil declines, the output capacity of cultivated land will also decline.

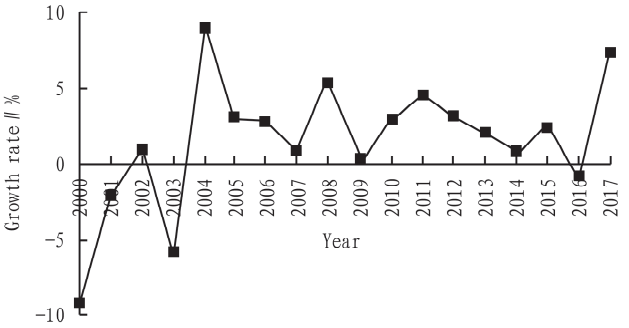

Fig. 1 Dynamics in growth rate of grain production in China during 2000 – 2017

4 Problems in the propelling process of arable land fallow

4.1 Land abandonment and "non-agriculturalization" after fallow Since the reform and opening up, along with the rapid development of China's economy, the phenomenon of land abandonment, random abandoned farming and " non-agriculturalization" in rural areas has been exacerbated. On the one hand, the relatively low efficiency, relatively high investment and relatively low output of agricultural production, as well as the rising prices of agricultural materials in recent years, have increased the burden of farmers' land. The resulting phenomenon is a reality that the majority of peasants has worked hard for a year and may still owe money. On the other hand, in the process of urbanization and industrialization, urban development and industrial construction require the use of cultivated land. Moreover, the land occupied in this process is basically farmland with good geographical conditions and fertile soil. Despite the policy of balancing the occupation and compensation, occupation and compensation is often unbalanced in practical work. The farmland used for compensation for reclamation is basically land with poor location and poor soil.

4.2 Farmers' willingness to fallow It is understood that more than 80% of the farmland in China is in a state of non-stop farming. When the cultivated land is over-loaded for a long time, the soil and water in the soil are lost due to too many disturbances, which eventually leads to the deterioration of texture and decline in fertility of the soil. By consulting the relevant literature, it is learned that a considerable number of farmers are willing to fallow. Most of the farmers who are willing to fallow are due to low income at home. In addition, the price of agricultural materials has been rising in recent years. In comparison, this part of the farmers chooses to work in cities to seek higher income levels, and at the same time, they are more willing to cooperate with the government's fallow policy. On the other hand, the farmers uncertain about fallow are more concerned about the subsidy level. If the government subsidies for fallow are in line with the local economic development level, most farmers will be willing to cooperate with the government to promote the implementation of the farmland fallow policy. Government departments should pay attention to methods when promoting farmland fallow work, and formulate a variety of policies that are conducive to farmers to encourage them to cooperate with fallow work.

4.3 Subsidies for arable land fallow The issue of financial subsidies for fallow farmers is the top priority of the fallow work. A reasonable subsidy method can not only ensure the economic benefits of farmers, but also promote the promotion of the arable land fallow system. In 2016, the central government issued a policy on arable land rotation and fallow, which mentions the relevant fallow subsidy standards for different food crops planted by farmers. It should be ensured that the economic compensation of farmers participating in fallow is equal to the original planting income, and the level of economic income of farmers cannot be lowered.

The policy issued mentions that the central government will distribute the compensation funds for farmland fallow to the provinces. Then, the provinces distribute them in accordance with relevant national policies and in light of actual conditions to the county and township level governments, by whom the farmland fallow compensation funds are distributed to the farmers. At the same time, in the policy promulgated by the central government, it is allowed to establish and improve the evaluation system of local arable land fallow work in the pilot areas where farmland fallow is implemented, according to the actual work needs, in order to guarantee the effective advancement of arable land fallow work, effectively prevent the deformation of the policies issued by the central government during the implementation in the counties and townships, and ensure the actual effect of farmland fallow work.

5 Suggestions on measures to promote farmland fallow under rural revitalization

5.1 Improving agricultural science and technology and vigorously developing modern agriculture The rural revitalization strategy document clearly puts forward opinions on deepening the structural reform of the supply side of agriculture. In the current new form and requirements, it is necessary to use problem-oriented principles. Stabilizing food production is a prerequisite for the long-term sustainability of the farmland fallow system. In the future work on the issue of agriculture, rural areas and farmers, we must adjust the focus of our work, accelerate the cultivation of emerging industries in agriculture and rural economy, and accelerate the pace of building modern agriculture.

5.2 Local government and farmers determining the agreement relationship on fallow Under the rural revitalization strategy, it is required to strengthen the integration of the government and the peasants. Advancing arable land fallow is a systematic project, and it is necessary to focus on the details while standing on the whole. To promote the fallow of cultivated land, the local government should be the main body to formulate the corresponding farmland fallow plan, and proactively educate farmers on the policies and benefits of farmland fallow. China should not only clarify the main position of the government when promoting the pilot project of arable land fallow, but also introduce a market model and learn from the market bidding mechanism adopted by the United States to give full play to the regulatory role of the market. Following the principles of equality and voluntariness, the wishes of farmers are fully respected. As the initiator and proponent of arable

(To page 34)

been absorbed, but it does not mean that the genius loci has disappeared. The characteristics of Hekou ancient town are still contained in its architecture, and the sense of identity has never been lost. From the perspective of landscape and settlement level, landscape is the definition of extension, and the settlement mainly reflects the covered entity. Now, with the development of society, the rise of railway transportation, the expansion of the new urban area, the historical mission of Hekou ancient town has come to an end. However, the unique relationship between its huge volume and Xinjiang River and Qianshan County is clear and evident, so that Hekou ancient town has a self-identity.

4 Conclusion

Hekou ancient town has a very long history of development and plays an important role in the construction of Qianshan County. The structure of the ancient town will continue to change with the intention of the builders in different periods. But this does not mean that the genius loci will die out, on the contrary, there will be a new structure that will bring new "genius loci". The new "genius loci" can still have a very close relationship with people's life. If you want to maintain the genius loci, you need to symbolize the characteristics of the place. In this process, it can form a high degree of recognition of the place. In order to protect and renew the architectural space design of the ancient town, it is necessary to explore the long history and culture of Hekou ancient town and the culture of genius loci behind the rich sentiment of humanity. This requires respect for the characteristics of the place, in order to arouse people's subconscious experience, and put it into people's real life. Through the blending of people and places, the effective continuation of the genius loci can be ensured.

References

[1] LI B, LI GW. Locus spirit of cemetery building[J]. Architectural Journal, 2007, 54(2): 92 – 95. (in Chinese).
[2] CHRISTIAN NORBERG – SCHULZ. Genius loci: Towards a phenomenology of architecture[M]. Taibei: Shanglin Publishing House, 1984. (in Chinese).
[3] County Chronicle Compilation Committee of Qianshan County. County Local Records of Qianshan[M]. Haikou: Nan Hai Publishing Co., 1990. (in Chinese).
[4] ZHANG Y, ZHOU B. Qianshan Hekou Town as the historic town located on the junction of the two rivers[J]. Hua Zhong Architecture, 2013, 31(4): 10. (in Chinese).
[5] PAN XH. Analysis and reproduction of the spirit of place in the ancient water towns in southern Yangtze River[D]. Wuxi: Jiangnan University, 2011. (in Chinese).

(From page 26)

land fallow, government should extensively absorb the participation of relevant stakeholders in the construction of the fallow subsidy mechanism. On the basis of reasonable guidance and appeal to farmers, government should listen to the opinions of farmers extensively, encourage and support farmers who are willing to fallow combined with relevant policies, and fully understand farmers who are unwilling to fallow. Government should sign a formal fallow agreement with farmers. As a credible organization, government should cultivate the contractual spirit of farmers through a statutory agreement on the basis of letting farmers who are willing to fallow to fully understand the fallow policy.

5.3 Doing a good job of fallow subsidies combining the actual situation The rural revitalization strategy adheres to local conditions and gradual progress, scientifically grasps the differences in rural areas and the characteristics of differentiation of development trends, and does a good job in design. Most western countries have designed a relatively complete farmland fallow ecological subsidy or compensation system to mobilize the enthusiasm of farmers for good farmland use behavior and promote fairness and justice. The fallow subsidy work is an important factor related to whether the fallow of cultivated land is attractive to farmers. The key to the development of arable land fallow is whether the farmers can cooperate, and whether the farmers can obtain reasonable fallow compensation is directly related to the long-term stable development of China's fallow system. China has a vast territory. It is unscientific and unrealistic to develop a unified compensation mechanism for arable land fallows that can be applied to the whole country. According to the actual situation of each place, compensation mechanism is developed in line with local conditions. The geographical difference between the eastern and central, western regions, and plain areas and mountainous areas of China is large. Therefore, we should fully consider the different situations in different places and appropriately refine the economic compensation standards, making relevant compensation policies and compensation standards more in line with local conditions, thus maintaining the sustainability of the arable land fallow system.

References

[1] ZHENG ZS. The necessity and safeguard measures of establishing land fallow farming system in China[J]. Journal of Wuhan Agricultural College, Agricultural Bank of China, 2002, (1): 77 – 79.
[2] CHUAI XW, HUANG XJ, ZHONG TY. Study on the quantity of cultivated land in China under fallow mode[J]. Journal of Shandong Normal University(Natural Science), 2008, 53(3): 99 – 102.
[3] LIU JY, LU ZX. American land fallow protection plan and its reference [J]. Commercial Research, 2009, 52(8): 134 – 136.
[4] LIN L, FU YJ. The necessity and model analysis of China's ecological compensation policy intervention[J]. Economic Problems Exploration, 2011, (11): 98 – 102.
[5] WANG XL. On the rational choice of ecological compensation model: From the perspective of the experience of American land fallowing program[J]. Journal of Zhengzhou University of Light Industry (Social Science Edition), 2012, 13(6): 69 – 72.
[6] ZHANG HF, WU YZ, HE LJ. Discussion on the implementation of fallow system in China[J]. Zhejiang Journal of Agricultural Sciences, 2013, 25(1): 166 – 170.
[7] LIU JW, SUN YY, YANG Y. Analysis on the change trend of original ecological carrying capacity of land in China[J]. Contemporary Economic Research, 2014, 25(3): 49 – 54.
[8] RAO J. Summary of "cultivated land recuperation" in developed countries and its enlightenment to China[J]. Agricultural Technology Economics, 2016, (9): 118 – 128.
[9] ZHUO L, ZENG FS. Enlightenment of fallow system in developed countries and Taiwan Province to the implementation of fallow system in mainland China[J]. World Agriculture, 2016, 38(9): 80 – 85.