Land Consolidation Model Implemented by Cooperated Rural Households——A Case of Hubin Village, Baijia Town of Dianjiang County

LIU Jun[*], **ZHOU Xuan**, **JIANG Yi**

Chongqing Yongneng Land Surveying, Planning and Design Co., Ltd, Chongqing 400015, China

Abstract In view of the problems faced by implementation model of cooperated rural households in terms of limited use scope, insufficient governmental policy and one-sided participation of rural households, the comprehensive evaluation index system of the feasibility of implementation model of cooperated rural households is established. From the macro-perspective, seven indexes including urban land use, township economic development stage, urbanization and township enterprise structure are selected. From the micro-perspective, 12 indexes including location situation, governance capability and economic developmental level at village level are selected. Besides, the multiple factors evaluation model is established. Taking implementation items of cooperated rural households in Hubin Village, Baijia Town of Dianjiang County as an example, the implantations items are analyzed by using the comprehensive evaluation model and the evaluation results are in accordance with actual situation. The effectiveness of the comprehensive evaluation method is proved. However, affected by the limited application scope of implementation model, insufficient policy and one-sided farmers' participation, in order to avoid copying the successful experience of completed pilot blindly, farmers are suggested to adopt the implementation model of cooperated rural households.

Key words Land consolidation, Implementation of cooperated rural households, Dianjiang County, China

Land consolidation is a necessary choice for Chinese government to solve the increasingly tense conflicts between people and land, and it is an important approach for realizing dynamic balance of aggregate farmland, improving the comprehensive production capability of agriculture, increasing farmers' income and promoting the development of rural economy[1−4]. In recent years, on the location and plan stage of Chinese land consolidation, the pure governmental dominance has been replaced by "limited governmental authority and effective public responsibility"[5], but on the implementation stage, as labors with low technology level, farmers' rights to participate in the implementation of the project, the use of capital, check and evaluation on the results are deprived of. Through the research and investigation on the implementation of the project on Hubin Village, Baijia Town of Dianjiang County, the paper analyzed the land consolidation projects implemented by cooperated rural households. The analysis is of great significance to promoting the healthy development of land consolidation in hilly areas; protecting farmers' rights and promoting the new village construction under the balanced development of urban and rural areas.

1 Connotation of the project model implemented by cooperated rural households

Projects implemented by cooperated rural households is the project adopted by areas with dispersed farmland to alleviate the conflicts caused in the process of operation and make up for the neglect of quality, practicability, production development and rear management caused by blind pursuit on speed and profits. In reality, it is represented by government investment and cooperated rural households handle in application and the mass invest labors and adopts the way of constructing at the same time of making up to establish the industrial supporting platform and conduct unified fund management[6]. The project impplemted by cooperated rural households is also called "agricultural pillar enterprises + farmers' cooperatives + rural households". On the basis of reconfirming land ownership, the collective economic organization-farmers' cooperatives, is concluded. Through agricultural pillar industries, the industrial items are introduced into. Through the joint application of rural households, the industrial items are included into the reservation of land consolidation project. The industrial adjustment of agriculture is taken as the core of the projects to leave greater survival and development space for farmers, who have lost their land operation rights. That is to say, it can protect farmers' interests through farmers' cooperatives, but also intensify the organization collective economy and increase farmers' income through the motivation of agricultural pillar industries, so as to provide reliable protection for land losing farmers.

2 Evaluation on the model of projects implemented by cooperated rural households

Since the formal launch of land development and consolidation project invested by the central government in 2001, Chinese land consolidation has gradually become a new industry with the comprehensive features of science, trans-fields and multiple technologies[7]. Besides, the land consolidation model has become formal gradually and the models explored primarily were as follows: governmental investment and BT and some other typical models. From the perspective of the implementation, the governmental investment model has achieved great implementation results, but the BT model is hard to exist. The major reasons are the lack of policy support; the absence of supervision mechanism and the difficulties in participating and

coordinating.

The practice assumes that although BT model plays a role in alleviating short-term financial pressure; realizing the increase of newly added farmland in short time; providing necessary construction land for guaranteeing economic development and realizing dynamic balance of aggregate farmland, the implementation results are far from the actual demands of farmers. Therefore, a model invested by the government and implemented by rural households is put forward. The implementation results of this model are closely related to the developmental stage of rural economic development, the demand of regional land use, planning conditions of villages and towns. And the implementation results is directly affected by micro factors, such as the developmental level of rural collective economy and village collective management. In order to comprehensively evaluate the fitting degree of the project invested by the government and implemented by cooperated rural households, the research established the practicable comprehensive evaluation system of second-level cooperated rural households implementation composed by the macro index and micro index (Table 1), to quantitatively analyze the applicability of the model implemented by cooperated rural households in special areas. Among the indexes, the basic fitting indexes are used to analyze the macro background of township economic development to determine whether the project has the external economic conditions for implementation the rural households cooperated model. The model implemented by rural households has the features of non-compensation and the whole household participation, so it

is an approach adopted by the government under the situation of enough financial support and farmers on the areas has low economic income level. It is closely related to the developmental stages of economy. Revised indexes are used to evaluate the feasibility of the implementation from the special projects under the background of the implementation model of cooperated farmers from the macro perspectives. They are the further evaluation compared with basic fit evaluation and the implementation from the phase of practice. In some areas, although they have the external conditions of adopting the model of rural households cooperated implementation, restricted by collective management level and economic situation of economy at village level, it is hard to get the expected results. Under such situation, the revised index analysis can evaluate results from the perspective of individual rural household.

In the research, the applicability comprehensive evaluation of the rural households cooperated evaluation is divided into two parts including basic fitting evaluation and comprehensive fitting evaluation. The quantitative calculation adopts the linear weighed index model and geometric weighted index model. According to the different influencing degree of different evaluation factors on evaluation results, the Delphi method is adopted to determine the weight of the factors. Through comprehensively evaluating the factors, the basic fitting evaluation and the comprehensive evaluation can be obtained. The expression of the evaluation model can be seen as follows:

$$I_1 = \sum_{i=1}^{7} W_i A_i, \ i = 1, 2, \cdots, 7$$

Table 1   Applicability evaluation index system of model implemented by rural households

Evaluation index	Evaluation factor	Relevant explanation	Index analysis
Macro index	Urban land use demand (A_1)	Reflecting the urban land supply and demand situation, the sources of newly added construction land and the potential of construction land	Composed by the newly added demands on construction and the area of farmland per capita
	Developmental stages of township economy (A_2)	Reflecting the developmental level and stage of township economy. An important factor for determining whether the town is fit for launching rural household cooperated implementation	It is related to economic basis, status of capital involved and expected usable capital
	Township degree (A_3)	Reflecting the developmental level, status and trend of towns	The high developmental stage and level of towns, the high rural households cooperated implementation
	Township industrial structure (A_4)	Reflecting the direction of township economic development and its role in motivating the regional economy and realizing the change of economic growth	Industrial structure determines the proportion of three industries
	Township plan situation (A_5)	Reflecting township plan level, planning land use types and land use approaches	Whether towns are included into the future developmental plan; planning the future development direction
	Township management capability (A_6)	Reflecting the management level and profit distribution of rural households cooperated implementation	The adherence of leaders and the degree of democratic management
	Township policy direction (A_7)	Reflecting the attention degree, enthusiasm and developmental direction of towns to rural households cooperated implementation	Whether the rural household cooperated implementation is included into the annual major work of the government
Micro index	Village location situation (A_8)	Reflecting geographic location and natural situation *et al.*	The better location, the better implementation conditions and the better conditions for rural households cooperated implementation
	Village management capability (A_9)	Affecting the feasibility, management level of rural households cooperated implementation and the understanding on expected development	The stronger the basic economic situation, the stronger the coherence of village collections

Evaluation index	Evaluation factor	Relevant explanation	Index analysis
	Village economic development level (A_{10})	Reflecting annual profits and disposable income of villagers and the reliance degree on agriculture	Economic basis determines whether rural households has the capability of investing construction
	Situations of infrastructure (A_{11})	Reflecting water conservancy, road, farmland protection and electric power and some other public infrastructure	The perfect infrastructure determines the industrial development and affects the input intensity
	Village industrial development status (A_{12})	Reflecting the position of dominated industries, the developmental directions of village industry, and the proportion of three industries	Determining the form and directions of planned content
	Educational degree of villages (A_{13})	Reflecting the educational level of villagers	Affecting villagers' understanding on rural household cooperated implementation
	Employment structure of villages (A_{14})	Directly reflecting the expectation of pillar industries and the arrangement of personnel involved	Affecting the rear management and use of implement
	The level of pillar industries (A_{15})	Reflecting capital of enterprise, management level and investment willingness	The bigger the influence of the enterprises, the obvious the demonstration effects
	The status quo of land resources (A_{16})	Reflecting land resource type, resource rights and resource use situation	Affecting the sustainable development degree of agricultural industry
	The degree of land transfer (A_{17})	Reflecting the degree of land contract right transfer	Affecting the available scale of industry and farmers' recognition on land transfer
	Potential of mechanization (A_{18})	Reflecting the approaches, areas and restriction situations for implementing mechanization under the current situation	The higher the mechanization degree and the intensity of labor input, the higher the output, or vice verse
	Villages' willingness on participation (A_{19})	Reflecting farmers' enthusiasm on participating location, measuring, planning, implementing and rear management	The higher the participation degree, the smoother the implementation. maintaining the profits of various aspects

$$I_2 = I_1 \times \prod_{j=8}^{19} W_j A_j \times A_j \times 100, i = 8,9,\cdots,19$$

In the equation, the subjective evaluation results: A_i is the score of macro evaluation factor; W_i is the weight of the I evaluation factor; I_1 is the results of micro evaluation; A_j is the score of the j micro index factor; W_j is the factor weight of the j micro index factors.

3 Models of rural households cooperated implementation in Hubin Village, Baijia Town and Dianjiang County

3.1 General situation of study area The fourth group of Hubin Village, Baijia Town and Dianjiang County is selected as the research area. It is located in the southwest of Dianjiang County and close to the terminal of Changchou Lake. It has 42 hm² land, 82 contractor households, 360 agricultural populations, 0.13 hm² of farmland per capita, more than 200 standing migrant workers. People stay at home and farm are nearly all old age people. In the area, grain production takes a dominant role in traditional agriculture and the dispersed cash crops are the supplementary, the net income per capita of farmers is less than 1 000 yuan. In the area, the educational degree of farmers is mainly primary school education, middle school education. Farmers with high school education are less than 3%. Many of them are major members in villagers' committee; the relatively low cultural structure has affected the participation degree of farmers. The villages have basic infrastructure, but the situation is poor. There are 8 hm² of land that have been transferred. The land which has been transferred has high mechanization degree. According to the developmental plan and actual situation of agricultural industry, the village has completed the construction of infrastructure including water conservancy, road et al. according to the demands of melon, fruits and vegetable base. The investment in the project has reached more than 45 000 yuan/hm². The pillar enterprises with certain technology and economy have been introduced into and the model of "agricultural pillar enterprises + farmers' cooperatives + rural households". After the implementation, all the land has been transferred and has realized mechanization. The income sources of farmers have expanded from the single grain production to compensation income after land transfer and the wages from the development of industry. Dianjiang County was the earliest county in Chongqing Municipality, which has implemented the pilot of land consolidation and has achieved certain fruits, but there are still some defects. After the successful experiences of the fourth group of Hubin Village, the implementation in the whole village is difficult. In order to analyze the phenomenon, the fourth group of Hubin Village has been analyzed from the perspective of the evaluation on the rural households cooperated implementation.

3.2 Evaluation on the adaptability of projects in research areas Through on-the-spot investigation and collecting resources, the Delphi is adopted to determine the weight of the evaluation factors and the factors. Through the evaluation model, the comprehensive evaluation value of each studying object can be calculated (Table 2).

3.3 Comprehensive analysis on the model of projects in the research area It can be seen from the above evaluation results that, no matter macro index or micro index, the research area all has high value, which represents that the rural households cooperated model has strong adaptability in research area. The counties of the research areas also got high

score in the analysis of macro index. But affected by the micro indexes including village collective management capability, the level of pillar enterprises, the degree of land transfer and the potential of mechanization, the comprehensive score is decreased. Therefore, in the process of rural households cooperated implementation, there are many restriction factors and the relevant departments should guide and help them. Through the improvement of part factors in micro indexes, they can create good conditions for the promotion of rural households cooperated implementation. Through comparing with the rural households cooperated implementation, the evaluation results and the actual situation is basically the same. It also improved the effectiveness of comprehensive evaluation method can be tested.

Table 2　Explanation and comprehensive evaluation on the evaluation factors of studying objects

Evaluation index	Evaluation factor	Average level of county of the research area	Evaluation results of research area
Macro index	$A_1 = 0.12$	The demand on land is imperative and the conflicts between farmers and land is prominent (0.8)	The demands on land is not so imperative
	$A_2 = 0.25$	The growth of economic development increases annually (0.6)	The growth speed is higher than the average level of the whole county (0.8)
	$A_3 = 0.15$	The development of the towns is in the stable development stage (0.8)	Towns develop rapidly (0.8)
	$A_4 = 0.14$	Taking the secondary industry as the major industry, the proportion is large than 53%	Taking the secondary and tertiary industry as the major industries, the proportion is bigger than 80%
	$A_5 = 0.08$	Guixi Town only is included into the scale of urban construction (0.5)	Not included into the scale of urban construction, but it has certain location advantages
	$A_6 = 0.16$	High management quality (0.7)	High diploma and high management quality (0.9)
	$A_7 = 0.10$	Timely reflection on county policy	According to the policy demand, new policy is put forward
	I_1	0.696 0	0.822 0
	$A_8 = 0.05$	Realizing the convenient transportation among villages (0.7)	Close to Changshou and 20 km far way from high way. Damage of rural major roads (0.9)
	$A_9 = 0.07$	The leadership of village collectives is mediocre (0.8)	Strong management capability and cadres of university graduates (1.0)
	$A_{10} = 0.08$	The economic basis is in the average level No capital accumulation	Has few capital accumulation (0.8)
	$A_{11} = 0.10$	Uneven, the overall level is bad	Has the infrastructure demanded by economic development
	$A_{12} = 0.09$	Taking primary industry as dominance, and the proportion is larger than 80%	Taking primary industry as dominance, and the proportion is larger than 75%; the tertiary industry has certain expects (0.8)
Mirco index	$A_{13} = 0.07$	Basically reflecting farmers' educational level (0.6)	Taking middle school as dominance, providing specialized training combining industrial development (0.6)
	$A_{14} = 0.06$	Taking the primary industry and working out as the main, the proportion surpasses 85% (0.9)	Taking the primary industry and working out as the main, the proportion surpasses 80% (0.9)
	$A_{15} = 0.11$	Lack of agricultural pillar companies, the average towns are less than 5 (0.5)	There are some pillar industries with certain influences (0.9)
	$A_{16} = 0.07$	Contractors farm by themselves (0.7)	All farmland has been transferred and there is no dispute on ownership right (0.9)
	$A_{17} = 0.08$	Low degree of land transfer and only 1.025% of land in the whole county was transferred (0.5)	All land in the area has been transferred (1.0)
	$A_{18} = 0.10$	The whole county has 3o thousand mu farmland farmed by machine and the planting area is 15% (0.6)	The region has realized mechanization (1.0)
	$A_{19} = 0.12$	The overall recognition is low and the self protection awareness is strong, the participation degree is limited in the period of construction	The participation form location to the rear management (1.0)
	I_2	46.08	73.90

4　Conclusion

The model of rural households cooperated implementation selects excellent land consolidation projects to implement, which has guaranteed the healthy and orderly development of land consolidation. The healthy and orderly development of land consolidation is the actual representation of balancing urban-rural development. But at present, the rural households cooperated implementation model still have many difficulties, it is represented as follows: the first one is the limited usage scale. The rural households cooperated implementation is suitable for the stable and healthy development of economic development. The operation and management capability cadres at village level should be improved, but at present, most villages are facing the problems, such as lack of capitals, management capability, low degree of land transfer, no motivation and low participation degree of farmers. Under such situation, rural households cooperated implementation may not obtain the expected profits. The second one is the insufficient policies. The

public affairs and providing public services to make industrial guild to be a important part of industrial management, rather than an afflicted institution of governmental departments[5]. But at present, the functions of Chinese rural economic association are still weak, and most functions are controlled by the government. Only when giving the relevant functions including industry admittance appraisal, stipulating standards on the quality of agricultural products to industry guilds, the industrial guild can really display its role and acquire the self-development capability.

4.4 Perfecting the stimulation and restriction mechanism of rural economic association Due to the great functions displayed by "able-men" in rural economic association, the effective stimulation and restriction on these "able-men" should be conducted. Besides, the association governed by able mean and democratic management should be combined. For one thing, the rural able-men know well about operation, management; have wide human relations; understand villages and farmers; have large influences and motivation and master the functions of rural economic associations and the operation of rural economic association. Therefore, more able-men should be introduced into rural economic association to fully display the enthusiasm and creation of able-men. For another thing, the democratic management system of rural economic association should be perfected to ensure the direction of "established by the people, managed by the people and to the benefit of the people" of cooperative economic association.

4.5 Intensifying the supervision and management on rural economic association From the perspective of genetic principles, non-profit association is included in "supplement theory" (the supplement of the invalid of public goods supplied by the government and market), "right distribution theory" (the government distributes the supply functions of certain public products to non-profit association and "autonomy theory" (citizens organize together voluntarily, spontaneously and democratically to provide public products and satisfy public demands. But no matter what kinds of theory, rural economic association should take certain public responsibility. The government should ensure the supervision on rural economic association to let it bear the public responsibility; display its positive role; avoid its negative role and fully display the role of rural economic associations in socialist new village construction. The key to supervising rural economic association is to master the entrance and exit of rural economic association. The registration work should be paid attention to, so as to ensure the high quality of rural economic association. The supervision on the established rural economic association should be intensified to eliminate ones which violate the laws and regulations in their operation.

References

[1] WU CY. The third sector: exploration and analysis about the function of the agricultural specialized economical association[J]. Journal of Sichuan Administration College, 2007(1): 5. (in Chinese).
[2] XI H. Public and private: operating mechanism of the third sector [M]. Beijing: Commercial Press, 2003: 136. (in Chinese).
[3] CHAI Y. Transaction cost and the choice of China's rural infrastructure governance structure[J]. China Rural Survey, 2009(1): 31. (in Chinese).
[4] KONG XZ, GOU YQ. The farmers' cooperative economic organizations in today's China and the government's function: a survey in 23 Provinces[J]. Issues in Agricultural Economy, 2006(1): 43. (in Chinese).
[5] YU JH. The orientation of role, function and objective of professional economic associations in rural areas[J]. Administrative Tribune, 2009(6): 25. (in Chinese).

areas, which can implement rural household cooperated implementation may clash with the existing policies, laws and regulations, under the imperfect situation, for example, poor adaptability of land transfer and feasibility, the unrealistic industrial plan, which is planed for catering to policies. Imperfect policies, laws and regulations defer the launch of rural households cooperated implementation, so it is hard to ensure the implementation results. The third one is the single participation of farmers. In the current plan of land consolidation, farmers' suggestions and willingness are ignored and in the process of implementing, someone tries to fight for his own benefits, thus, the plan can not satisfy the demand of actual development and the quality of the project can not reach the standard. Rural household cooperated implementation needs the comprehensive participation of farmers in the stages of location, planning, implementing, checking and rear management. The one-sided participation can not realize the lasting profits of land consolidation and it will increase the costs, which has increase the probability of repeated investment in realizing new village development.

References

[1] GAO XJ. Land consolidation and building of new socialist countryside[N]. China Land and Resources Newspaper, 2006 – 02 – 06. (in Chinese).
[2] LIU WJ. Actively promote land consolidation, to achieve an overall dynamic balance of cultivated land[J]. China Land, 1997(7): 17 – 19. (in Chinese).
[3] LU XS. General strategy of land consolidation in China[J]. Transactions of the Chinese Society of Agricultural Engineering, 2002, 18 (1): 1 –5. (in Chinese).
[4] WANG YL, LI ZJ, ZHANG JG, et al. A study of the current situation and suggestions of peasants participating in land consolidation[J]. China Land Science, 2008, 22(5): 47 –50. (in Chinese).
[5] GAO XJ. Land development project feasibility study and evaluation [M]. Beijing: China Personnel Press, 2005: 73. (in Chinese).
[6] WANG Y, DA Y, XIAN S. Dianjiang implements farmer partnerships land development and pilot[J]. Chongqing Land and Real Estate, 2009(4): 25 –26. (in Chinese).
[7] GAO XJ. Land Consolidation Engineering[M]. Beijing: China Personnel Press, 2005: 1. (in Chinese).