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The Tobacco Farmers' Mutual Assistance and Cooperation Pattern in Modern Tobacco Agriculture in Mountainous Areas

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Abstract This article introduces the basic situation of Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town of Xianfeng County. It analyzes the operating mode of tobacco farmers' mutual assistance and cooperation association, and conducts a comparative analysis of tobacco farmers' costs and benefits before and after participating in mutual assistance and cooperation. Studies show that the mode of tobacco farmers' mutual assistance and cooperation, is conducive to reducing labor in curing link, promoting the quality of tobacco, increasing tobacco farmers' income, which is worthy of promotion.

Key words Modern tobacco agriculture, Mutual assistance and cooperation, Production organization mode, Mountainous areas

With the in-depth construction of the modern tobacco agriculture, the basic facilities for tobacco production are constantly improved, and the level of facility-based production level continues to be improved. On the basis of never breaking the household contract responsibility system, how to achieve new development of "unified management combined with independent management", and effectively carry out the innovation of tobacco production organization, becomes a key issue urgently to be addressed, for the development of modern tobacco agriculture, and continuous development of tobacco pillar industry^[1]. In the development process of current modern tobacco agriculture, all regions are exploring the production organization mode suitable for their own development^[2-3]. In 2011, Xianfeng County in Enshi Prefecture of Hubei Province actively established tobacco farmers' cooperatives, carrying out specialized production services on the basis of tobacco production modernization in mountainous areas. Based on the innovation of production organization, this article takes Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town of Xianfeng County as an example, to explore the tobacco farmers' mutual assistance and cooperation mode in mountainous areas.

1 The basic situation of Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town of Xianfeng County

1.1 The establishment background of Yanziqian Tobacco Farmers' Jiamachi Shibao Village is one of the main producing areas of tobacco in Xianfeng County, and Yanziqian is the

core area of Shibao Village, with a growing area of tobacco at 8.53 hm², where the growing areas are concentrated; the production level of tobacco is high; the average family labor is uneven; the tobacco is planted by individual household; the production level of tobacco and income level are uneven. Solving the shortage of labor and the problem of technical level for tobacco farmers is the key to improving the quality of tobacco and income level.

In 2011, Yanziqian established 10 new horizontal curing barns, becoming the basic conditions for carrying out cooperative curing and mutual assistance in Yanziqian. Relying on the curing barns and other production facilities, Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association was established. In the links of harvesting and curing, the mode of cooperation and mutual assistance is adopted, promoting the tobacco farmers' mutual assistance and cooperation in tobacco production and making them carry out tobacco production according to the tobacco farmers' organization mechanism of "planted by individual household, cooperative operation, professional services".

1.2 The basic situation of mutual assistance and cooperation association Jiamachi Yanziqian Mutual Assistance and Cooperation Association was established in mid-July. Under the guidance of the village committee and the base unit cooperatives, 9 tobacco peasant households constitute the tobacco farmers' mutual assistance and cooperation association.

The area of tobacco planted by this association is 18.53 hm² in total, including the specialized commissioned curing area of hm², and mutual assistance and cooperation curing area of 15.2 hm². The greatest planting area of tobacco farmers is up to 6.67 hm², and the least area is 0.67 hm², mostly 1.73 hm²; the growing area per household is not big. The cooperative association now has 14 labor forces, and 2 Guiyang tractors. The cooperative association mainly takes the form of mutual assistance and cooperation, to complete the work from tobacco har-

vesting, transport, tobacco leaf binding, curing and other links.

2 Analysis of the operating mode of Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town of Xianfeng County

In view of the average planting scale of household and tobacco farmers' family labor conditions, Yanziqian tobacco farmers' cooperative adopted two operating modes of mutual assistance and cooperation in 2011, namely dominated by cooperative operation, supplemented by professional services. The cooperative operation means that each household of tobacco farmers send the same labor to be deployed and managed by the association, jointly responsible for the completion of each household's tobacco harvest and curing work. Professional services mean that after completing the task of harvesting and curing, the mutually assisted operating groups can provide the professional services of harvesting and curing for other non-mutual assistance peasant households, and collect the service charges.

The preliminary practice of combining the two modes has proved that the mode of cooperative curing effectively solves the technical puzzle of curing and shortage of labor for curing, the curing level and tobacco curing quality are significantly improved, and benefits of cooperation are obvious. This new specialized cooperative organization pattern plays an important role in fully improving the labor efficiency and promoting the quality of tobacco, becoming an important part of modern tobacco agriculture production organization in mountainous areas^[4].

2.1 The operating group setting and division of labor based on specialization in mutual assistance and cooperation association To ensure that the curing work is orderly carried out, the association establishes the operating group and adopts the specialized division of labor. First, yy serves as the leader of operating group, yjj serves as vice-group leader, and 14 members in the mutual assistance and cooperation association are all involved in the operation. Second, it consists of harvesting operating group, transport operating group, tobacco-binding operating group and curing operating group. The organizational structure is seen in Fig. 1.

2.1.1 Harvesting operating group. It is constituted by all labor forces participating in the mutual assistance and cooperation, responsible for timely harvest of the tobacco of farmers within the association, according to the unified arrangement.

2.1.2 Transport operating group. It is dominated by carrier vehicle owner Yang Yao and Yang Jianjun, complemented by a labor force helping loading and unloading, responsible for timely transporting the fresh leaves picked to the tobacco-binding site in the curing barn after tobacco harvesting.

2.1.3 Tobacco-binding operating group. It is dominated by the family female labor in association, primarily responsible for timely carrying out leaf binding of fresh leaves harvested.

2.1.4 Curing operating group. It is dominated by the tobacco farmer yy and yjj with excellent curing skills in the cooperation

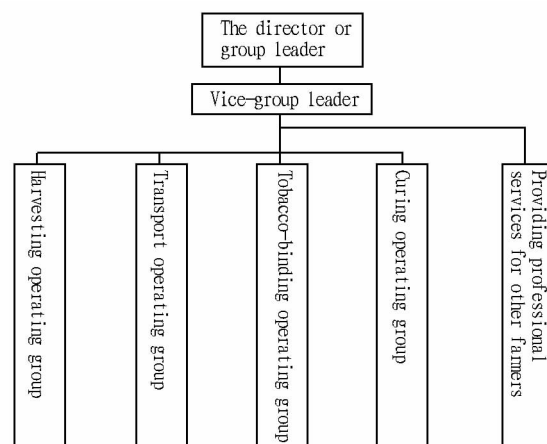


Fig. 1 The organizational structure of mutual assistance and cooperation association

association, responsible for the curing of all tobacco in cooperation association. At the same time, the curing operating group still needs to carefully record the number of curing barns, number of stems, amount of coal and the process of curing, so as to facilitate the checking of curing electricity bills and fuel costs.

2.2 The internal management of the mutual assistance and cooperation mode The ultimate goal of adopting mutual aid is to improve labor efficiency, and reflect the effect of cooperative operation, which not only requires cooperation, joint consulting and mutual aid between the members of cooperation association, but also requires normative internal management. In Yanziqian of Jiamachi, the tobacco farmers' mutual assistance and cooperation association adopts the mode of "6 unification" to refine the internal management^[5].

2.2.1 Unified labor use management. To guarantee the balance of labor mutual assistance, the cooperation association should conduct a detailed record of daily labor, employment, and each tobacco farmers' number of curing barns and stems. After the end of the curing, according to the total amount of labor, total number of stem and number of labor sent by each household, combined with each household's number of stem and labor, the household offering less labor will complement certain labor fee for the household offering more labor in accordance with the local labor prices, ultimately achieving the balance of labor mutual assistance between households.

2.2.2 Unified curing technique. Through the operating mode of mutual assistance, the cooperation association selects two tobacco farmers with excellent curing skills, to establish curing operating group, achieving the sharing of curing technique, so that good curing technique is shared by every household. At the same time, in the mutually-aided curing, the communication and exchange between members can also further improve the curing technique and ensure the quality of curing.

2.2.3 Unified scheduling and use curing facility. As for the coal tools, means of transport, binding tools, tobacco-binding machinery, and other curing facilities and equipments needed in the process of mutual assistance and cooperation in curing, the cooperation association implements the sharing by all mem-

bers and unified use. Due to great value in some vehicles such as tractor, they are scheduled by the group leaders to be shared by all members. The cooperation association implements common use of coal tools, tobacco binding tools and tobacco-binding pole.

2.2.4 Unified work scheduling. With all tobacco farmers in the cooperation association as the main body, the group leaders conduct unified work scheduling in accordance with the field maturity, organize all labor forces to carry out unified harvesting, transport, tobacco-binding, and curing of the same household of tobacco farmers' tobacco, one household by one household; for different farmers' tobacco in the same curing barn, it is necessary to carry out unified marking.

2.2.5 Unified fuel supply. The cooperation association organizes unified purchase of coal. Before the curing, the tobacco farmers turn over the coal payment based on the growing area; after the curing, it is apportioned equally to each household of tobacco farmers on the average based on the number of stem in curing. The normal electricity costs of curing barn based on the curing record are equally shared by all members according to the number of stem in curing. The fuel consumption costs arising from power generation for temporary power outage are equally shared by all members.

2.2.6 Unified on-site management. According to the number mark of curing barn, the curing barn is scheduled for use in a unified way. When the amount of tobacco harvested by the farmers is less than one box, other farmers' tobacco can be harvested and marked to fill the box. After completing all, the members of the cooperation association are responsible for the clean-up of the site.

3 Analysis of the benefit of Yanziqian tobacco farmers' mutual assistance and cooperation mode in Jiamachi Town of Xianfeng County

3.1 Cost analysis

3.1.1 Reducing labor input cost. From the survey of traditional labor use, harvesting, curing and grading basically account for 60% of total labor. And the labor is of great intensity, greatly bound by time. Therefore, the reduction of labor in harvesting and curing is an important way to reduce total labor costs^[6].

After adopting the mode of mutual assistance and cooperation, the harvesting and curing are entirely completed through mutual assistance of labor forces, thereby forming the labor balance, saving the cost of employment and reducing the tobacco farmers' input costs of planting and operation. Through survey and analysis, the mutual assistance and cooperation in the links of harvesting and curing can reduce labor by 52.2/hm². In accordance with the local labor price (60 yuan per one), the labor input costs can be reduced by 3 150 yuan/hm².

(i) The link of harvesting and tobacco leaf binding. The traditional single household's harvesting tobacco and binding tobacco leaf need labor of 66/hm². After adopting the mode of

mutual assistance and cooperation, 11 people can complete all work (including tobacco harvesting and tobacco leaf binding) in 1.73 hm² of tobacco field in a day, converted into the labor of 6.36/hm². The tobacco farmers participating in mutual assistance and cooperation believe that 8 people can complete all work in 1.33 hm² of tobacco field in a day, converted into the labor of 6/hm². Based on this estimate, tobacco harvesting and tobacco leaf binding will be 24/hm² less than the original.

(ii) The link of curing. According to statistics, the single household's growing area is about 1.33 hm²; the curing barn is horizontal bulk curing barn; the household curing labor is 37.5/hm².

However, in the mutually-aided and cooperative curing, the curing barns are concentrated, and 10 curing barns practise unified management, which can effectively reduce the labor. In 2011, 2 people in the mutual assistance and cooperation group were responsible for the curing work, and the curing spent a total of 52 days, that is, the labor was 104, the number of curing barn was 78, the labor per barn was 1.33, the curing labor was only 9.3/hm², 28.2/hm² of labor less than the previous household curing labor (37.5/hm²).

3.1.2 Improving the labor productivity. Mutual assistance and cooperation avoids the phenomenon of 2 to 3 days being spent on harvesting and tobacco-binding in the past. At the same time, it solves the problem that when the tobacco is ripe, there is no sufficient labor for timely picking and curing, which lays a solid foundation for improving the quality of tobacco curing.

3.2 Economic benefit analysis

3.2.1 Comparison of tobacco farmers' tobacco sale before and after the establishment of cooperatives. Comparison of tobacco farmers' tobacco sale before and after the establishment of Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town can be seen in Table 1.

In 2010, Jiamachi Yanziqian did not establish the mutual assistance and cooperation association. After the association was established in 2011, the tobacco farmers' growing benefits were increased. In 2011, 9 households of tobacco farmers participated in the mode of mutually-aided and cooperative curing, of which 5 grew tobacco in the previous year, and other tobacco farmers continued to grow tobacco after returning home from outside.

Table 1 shows that due to the establishment and operation of mutual assistance and cooperation association, the quality of tobacco was improved significantly in 2011; compared with 2010, the average price increased by 2.5 yuan/kg, and the output value increased by 9 131.82 yuan/hm². In the mode of mutual assistance and cooperation, the emotional foundation is established among tobacco farmers, whose sense of responsibility is strong; some critical curing techniques are shared by everyone, ultimately benefiting everyone.

3.2.2 Comparison of the economic benefits between mutual assistance and cooperation association and the whole village. Comparison of the tobacco sale between mutual assistance and cooperation association and the whole village in 2011 is shown in Table 2. In 2011, there were 152 of tobacco growing households in Shibao Village. In comparison with the tobacco sale in

the whole village, there was no big difference in the average yield of tobacco between cooperation associations, but the average price was 0.48 yuan/kg higher than that in the whole vil-

lage, so the output value under the mode of mutual assistance and cooperation was 2 527.54 yuan/hm² higher than the average in the whole village, with better economic benefits.

Table 1 Comparison of tobacco farmers' tobacco sale before and after the establishment of Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Jiamachi Town

Mutually-aided and cooperative tobacco farmers	Variety	The growing area//hm ²		Amount for sale//kg		The average price//yuan/kg		The output value per unit area of land//yuan/hm ²	
		2010	2011	2010	2011	2010	2011	2010	2011
lys	Yunyan 87	0.67	0.67	1 250	1 616.40	13.52	18.9	25 223.88	45 596.96
lyk	Yunyan 87	1.67	0.67	3 220	1 524.05	14.04	16.65	27 071.14	37 873.78
yji	Yunyan 87	0.8	1.73	1 600	3 720.00	14.18	17.33	28 360.00	37 264.51
ywb	Yunyan 87	0.8	1.73	1 650	3 747.50	15.12	15.89	31 185.00	34 420.68
yyj	Yunyan 87	1.33	1.87	2 500	3 850.00	13.64	16.37	25 639.10	33 702.94
yjb	Yunyan 87		1.73		3 612.95		16.6		34 667.61
ywh	Yunyan 87		1.73		3 747.75		16.06		34 791.25
yy	Yunyan 87		1.73		3 739.85		17.55		37 938.94
lj	Yunyan 87		6.67		13 740.00		16.21		33 392.11
Total/Average		5.27	18.53	10 220	39 298.5	14.07	16.57	27 495.82	36 627.64

Table 2 Comparison of the tobacco sale between mutual assistance and cooperation association and the whole village in 2011

Unit	Variety	The growing area//hm ²	Amount for sale//kg	The average price//yuan/kg	The average yield//kg/hm ²	The average output value//yuan/hm ²
Shiban Village	Yunyan 87	114.67	242 987	16.09	2 119.05	34 100.10
Mutual assistance and cooperation association	Yunyan 87	18.53	39 298.5	16.57	2 120.4	36 627.64

4 Experience and revelation of the tobacco farmers' mutual assistance and cooperation mode in Jiamachi Town of Xianfeng County

Through the mode of union of decentralized households and mutually-aided operation, Jiamachi Yanziqian Tobacco Farmers' Mutual Assistance and Cooperation Association in Xianfeng County has effectively solved the labor shortage and production technology obstacle arising from the expansion of production scale, providing some ideas for the organizational construction of tobacco farmers in the mountainous areas.

4.1 Experience of the tobacco farmers' mutual assistance and cooperation mode in Jiamachi Town

4.1.1 The mutual assistance and cooperation reduces the labor cost. Under the mode of decentralized household operation, in the tobacco harvest season, the same batch of tobacco is almost ripe at the same time, so the household has no choice but to hire labor to carry out the operation to ensure the harvest in a timely manner, resulting in an enormous amount of labor expenditures. The mutually-aided operation achieves mutual assistance of labor, successfully resolving the problem, and saving large sums of labor wages, with extremely obvious reduction of costs.

4.1.2 Mutual assistance and pool operation can effectively promote the improvement in labor efficiency and product quality. Traditional single-family operation is restricted by the amount and nature of labor, and the cooperation efficiency in some links is poor (such as harvesting, transport, curing), thereby resulting in the reduction of overall labor efficiency. After the implementation of mutually-aided operation, the male

and female labor forces are adjusted and complement each other, to give full play to the advantages of different labor forces, thereby reducing labor waste caused by labor allocation, and greatly improving the efficiency of labor. Mutual assistance enhances the members' responsibility, decreases the labor reduction phenomenon, and improves the harvesting, transport, binding and curing quality of tobacco.

4.1.3 Division of work and collaboration ensure the sharing of technology and the enhancement in tobacco curing quality. Compared with the traditional mode of household operation, mutually-aided operation has more prominent advantages in the curing technique, which can significantly improve the quality of tobacco.

Firstly, under the former mode of single-family operation, completing the harvesting, transport and tobacco leaf binding in one barn will take 2–3 days of operating time; after the implementation of mutually-aided operation, completing the above work will take only one day, greatly reducing the piling and airing time of fresh tobacco, so as to provides a guarantee for improving the quality of tobacco curing.

Secondly, under the former mode of single-family operation, due to uneven level of tobacco farmers' curing technique, the level of quality of tobacco cured is uneven; after the implementation of mutually-aided operation, the members with high technical level, first carry out tobacco curing, achieving the technology sharing, and improving the overall quality of the tobacco curing.

Thirdly, due to the formation of the assembly-line, the degree of specialization is improved; the technical proficiency in harvesting, tobacco leaf binding, and curing is also promoted rapidly; the technicians' technical guidance is targeted, provi-

ding solid protection for harvesting and curing technique.

4.1.4 Centralized operating fully embodies the maximization of facility use efficiency.

First of all, cooperation association carries out centralized scheduling of the curing barn, and the members' tobacco can adopt integrated curing according to needs. On the one hand, it successfully solves the problem of energy waste caused by the fact that the single batch of tobacco can not fill one curing barn; on the other hand, it effectively reduces the difficulty in curing different quality of tobacco, and greatly solves the problem that different quality of tobacco has to be cured in one barn due to insufficient number of tobacco in decentralized household curing.

Secondly, the resource sharing of supplies tools is achieved among members, such as transport vehicles, tobacco loading pipe and tobacco-binding pole. The idle resources are fully utilized, achieving the maximization of resource use efficiency, and to some extent, achieving the overall reduction of labor and costs.

4.1.5 Unified scheduling improves the harvesting and curing link and makes the farming operation more timely. According to the maturation of tobacco in the field, cooperation association conducts unified scheduling of harvesting and curing. On the one hand, due to improvement in the cooperation association's work efficiency and expansion of team, the timeliness of harvesting and curing is greatly improved, and the maturity of single batch of tobacco is also greatly improved; on the other hand, due to improvement in the timeliness of harvesting and

curing, tobacco farmers' ability to control the maturity of tobacco in the field is also greatly improved.

4.2 Promotion and exploration of the mutual assistance and cooperation mode The difficulty in the balance of mutually-aided labor between different scale growers must be properly handled. In the future tobacco production, how to fully tap and refine this experience, improve the mode in terms of institution and organization, and promote the mutually-aided operation mode, needs to be further explored.

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Shaanxi Province in 1997 to 2010 will bring an increase of 0.033 742% in property income. From analysis, it can be seen that there is a significant correlation between the per capita property income and the net income of prior year of farmers in Shaanxi Province.

3 Conclusions and recommendations

In conclusion, raising total income of farmers in Shaanxi Province is favorable for increase in their property income. Shaanxi Province is weak in agricultural foundation and low in agricultural industrialized development level, leading to low income level of farmers in Shaanxi Province and restricting the growth of farmers' property income. In this situation, it is proposed to steadily push forward the construction of new socialist countryside and energetically develop rural economy in Shaanxi Province. Besides, it is recommended to raise farmers' total income, to turn farmers' property into property income.

Shaanxi Province should carefully implement various policies of benefiting farmers and increase farmers' property income and transfer income^[5–6]. All regions should implement "four subsidies" policies without any reservation. Those cities and counties with good conditions should expand the subsidy range and raise the subsidy standard. In addition, it is re-

quired to strengthen construction of rural public health and basic medical service system, and improve the rural endowment insurance system. Furthermore, it is proposed to enhance the support for rural education, popularize and consolidate the nine – year compulsory education, continue to exempt rural students from incidental expenses, provide free textbooks for poor family students, and provide living subsidies for poor family boarding students. Finally, it is recommended to insist on lawful, voluntary and compensated principles, push forward circulation of rural land, and vitalize farmers' various stock assets, to increase farmers' property income through many channels.

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