

Vertical and Horizontal Linkages with Small-scale Farmers in Developing Countries: Evidence from China

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Abstract

Throughout the developing world, the food supply chain has undergone tremendous and fundamental structural changes in the great context of globalization and emergency of modern supply chain. Despite growing market opportunities carried out by these changes, at the same time, it also offers considerable threats for small-scale farmers due to their poor abilities to access market. Therefore, understanding how to help small-scale farmers to strengthen market access is particularly important in developing countries where there are three of every four poor people living in rural areas. There is a widely held belief that both vertical and horizontal coordination are playing an important role to help small-scale farmer to access market and overcome the constraints faced by individual small-scale farmers through the collective action and reducing transaction costs. However, from the farmers' perspective, this paper argues that the horizontal coordination (farmer organization) is an appropriate governance structure for linking small-scale farmers and other market actors in the food supply chain. Moreover, this paper also depicted the main linkages in the context of agricultural industrialization in China. The rapid development of farmer's specialized cooperatives shows that farmer organization and collective action are more suitable for farmers' needs to access markets.

Key Words: Small-scale Farmers, Vertical Linkages, Horizontal Linkages, Developing Countries, China

1. Introduction

A "supermarket revolution" has indeed occurred in developing countries since the early to mid 1990s (Reardon, T. and A. Gulati [1]). The rise of the supermarket is spreading quickly, and they are starting to modernize their produce procurement system, differentiating them from those used by traditional retailers and wholesalers (Reardon, Timmer, Barrett, and Berdegue' [2]). With the great changes in retail companies, the logistic channel of agricultural produce has also undergone rapid and fundamental structural changes. Moreover, consumers are becoming more demanding in terms of quality and safety and

prefer to buy convenience foods due to rising income. Therefore, farmers had to face the huge challenges to access markets in the context of the rapid changes in food supply chain and consumer preference (quality, food safety, etc.).

However, it is clear that it is not easy for small-scale farmers in developing countries to access the market, because those farmers lack information on prices and technology, weak connections with market actors, absence of input and output markets, credit constraints and high transaction costs. This requires close linkages between farmers, processors, traders and retailers to coordinate the supply and demand, and to access such services as market information, input supplies and transport services (Miehlbradt, A. O., McVay, M [3]).

From the farmers' perspective, there are two types of market linkages to help small-scale farmers. They are vertical linkages between farmers and other market actors (traders, processors, agrifood companies, retailers, etc.) and horizontal linkages among farmers. A key issue is, which type is better for small-scale farmers on behalf of their interests while helping them to access markets. This discussion paper will first compare the disadvantages and advantages between the vertical and horizontal linkages from the small-scale farmers' perspective. Then this paper will take China's case as an example and show the history of farmer cooperatives and main linkages in China. Finally, this paper will also discuss the implication to promote the development of farmer organization in China.

2. Previous Studies on Vertical and Horizontal Linkages

Vertical coordination refers to the synchronization of successive stages of production and marketing, with respect to quantity, quality, and timing of product flows (Gulati, A., Minot, N., Delgado, C., Bora, S. [4]). To guarantee consistent and quality supplies, traders and processors engage in vertical coordination to overcome farmers' constraints (Swinnen, J. F. M., and M. Maertens [5]) by involving the provision of seed and fertilizer on credit, technical assistance and a guaranteed price at harvest. Contract farming is an important form of vertical coordination, which is an institutional solution to the problems of market failure in the market of credit, insurance and information (Key and Runsten [6]), and the arrangement commonly used to guarantee product quality and food safety standards (Bijman, Jos, and Meike Wollni [7]). Also there are some agencies who consider contract farming as one of the main instruments to link small-scale farmers to domestic and even foreign markets and thereby to reduce poverty (World Bank [8]).

However, critics argue that smallholders will be excluded from the coordinated supply chains with the growth of large format stores, shrinking of wet markets and traditional retail outlets, and the change in the procurement systems (Gulati, A., Minot, N., Delgado, C., Bora, S. [4]). Another concern is that the problems which farmers in less developed regions of the world face in dealing with the requirements and standards of these modern supply chains (Henson and Reardon [9]). Contract farming also has been criticized as being a tool for agribusiness firms and food multinationals to exploit unequal power relation-

ships with farmers (Warning M. and N.Key [10]). And large agribusiness firms use contracts to take advantage of cheap labor and transfer production risk to farmers (Little, P., & Watts, M. [11], Singh, S [12]).

A farmer organization (Note 1) is a classic example of horizontal relationships, which can help small-scale farmers to participate in the market on behalf of the farmers' interests and place them in an equal position. Acting collectively through the horizontal relationship, smallholders can be in a better position to reduce transaction costs of accessing inputs and outputs, obtain the necessary market information, secure access to new technologies, enter the high value markets, allowing them to compete with larger farmers and agribusinesses (Stockbridge, M., Dorward, A., Kydd, J. [13]), and improve their bargaining power with buyers and intermediaries (Kherallah, M., Delgado, C., Gabre-Madhin, E., Minot, N., Johnson, M. [14]).

Moreover, a number of studies argue that the farmer organization can combine horizontal coordination with vertical coordination in the supply chain. Combining farmer cooperation with contract farming often works best. These contracts which are negotiated with farmer organizations gain from the additional bargaining power. Both parties benefit from lower transaction costs than would be the case if agribusiness negotiated a separate contract with each farmer (Stockbridge, M., Dorward, A., Kydd, J. [13]). Seen from the agricultural supply chain in China, the supermarket and process enterprises have been the core enterprises to link farmers, but there are a lot of small sized farmers in the downstream, and it causes the very high transaction and control costs. The modes of "leading enterprise + cooperative + farmers" and "supermarket + cooperative + farmers" have gained better performances in raising food safety and guarantee a steady supply chain for food products (Meizhang, xiangyuGuo [15]).

3. History and Evolution of Farmer Cooperative in China

In China, farmer cooperatives have played an important role in rural development as well as other developed countries, and have been used as a way of organizing farmers. The evolution of Chinese farmer cooperatives is a very complex issue, which is profoundly influenced by Chinese economic and social development. Historically, the term "cooperatives" had got into general use in the planned economy period. At that time, Chinese farmer cooperatives had experienced such periods as, Mutual Aid Team (1950-1953), Elementary Cooperatives (1953-1955), Advanced Cooperatives (1955-1957), People's Commune (1958-1978) (Chen liuqing, Hu zhenghua [16]). Because Chinese government initiated its economic reform and introduced the Household Responsibility System (HRS) (Note 2) within agriculture sector in 1978, the year "1978" is a potential watershed year in the history of China. Here, we briefly look back at the history of Chinese farmer cooperatives before 1978.

Since new China was founded in 1949, the new government carried out a nationwide

Table 1 Scale of Mutual Aid Team and Cooperatives (Average Per Team or Cooperatives)

	Mutual Aid Team (1954)	Elementary Cooperatives (1955)	Advanced Cooperatives (1957)
No. of Households	7	27	170
No. of Population	30	124	740
No. of Labourers	15	60	349
Arable Land (Mu)	98	470	2179

Source: Zhangyue Zhou, 2004 [17]

land reform in order to confiscate landlords' land and distribute it equally to poor and landless farmers from 1949 to 1952. Therefore, China's agriculture became a small peasant economy based on private ownership and household operation. Although many farmers were filled with enthusiasm to work their own land, however, many rural households still lacked capital, draft animals, farming tools, and their production activities were limited due to poor means of production. Under such circumstance the government organized the farmer households to set up agricultural cooperatives in order to increase production and grow crops efficiently.

From 1950 to 1953, the cooperative form of "Mutual Aid Team" (MATs) was adopted to help farmers and pool resources. Mutual Aid Team were small scale, usually with seven neighboring households (average per team) joining to work cooperatively on the basis of voluntary participation (Table 1). Although those farmer households exchanged labor input, shared their farm tools and draft animals, land, means of production and harvests still belongs to individual households. By 1952, 39.9 percent of China's rural households joined the Mutual Aid Team (Table 2).

During the same period, a small number of peasants were starting to move to the higher stage: Elementary Cooperatives. Mutual Aid Team was gradually replaced by Elementary Cooperatives from 1953 to 1955. 27 households (average per cooperative) participated in the Elementary Cooperative (Table 1), and members pooled their lands and large agricultural tools and draft animals and worked the land together under a unified management. The crop and other income were distributed according to two principles: one payment for the input of land, draft animals, and farm contributed by each member, and one payment for the labor input by each member (Hu, Yamei, Huang, Z., Hendrikse, George W. J. and Xu, Xuchu [19]). By the end of 1955, 63.3 percent of China's rural households the Elementary Cooperative, but the percentage of China's rural households who joined the Mutual Aid Team have fall to 32.7% from 58.3% in 1954 (Table 2).

With a strong push by the government, the bigger cooperatives called Advanced Cooperatives emerged in 1955, which can contain 170 households (average per cooperative) (Table 1). In the Elementary Cooperatives, an individual family still retained the ownership of their lands and derived its income partially from these lands. But unlike in the Elementary Cooperatives, the property of lands and all means of production legally belong to Advanced Cooperatives. Moreover, members worked according to centralized management, and payment for the members of Advanced Cooperatives was only based on the labor in-

Table 2 Percentage of Households Participating in Agricultural Cooperative out of Total Households Between 1950 and 1958

Year	Mutual Aid Team	Elementary Cooperatives	Advanced Cooperatives	People's Commune
1950	10.7			
1951	19.2			
1952	39.9	0.1		
1953	39.3	0.2		
1954	58.3	2.0		
1955	32.7	63.3	4.0	
1956	19.7	49.6	30.7	
(January)				
July	7.6	29.0	63.4	
Year end	3.7	8.5	87.8	
1957			93.5	
1958				99.1

Source: Alexander Eckstein, 1977 [18]

put by each member. By the end of 1957, 93.5% of the rural households had been persuaded to become members of the Advanced Cooperatives, and there were no Mutual Aid Team and Elementary Cooperative at this time (Table 2).

In 1958, the Chinese government changed the cooperatives into People's Commune. The property of all land and other means of production were owned by the People's Commune. Everything originally owned by the households, private animals, stored grains and other food items were also contributed to the People's Commune. A work point (Note 3) system was used to calculate rewards, at the end of the year, each member of the commune could be eligible for cash rewards according to the accumulated work points. Under the system of collective farming, supplying of farming inputs, producing and selling products were all centrally planned by governments and were not allowed to trade freely in markets (Hu, Yamei, Huang, Z., Hendrikse, George W.J. and Xu, Xuchu [19]). By the end of September in 1958, over 740,000 Advanced Cooperatives were all converted to about 26,000 People's Commune, including 1.2 billion farmer households (Feng Chen [20]), and accounting for 99.1% of total households in China (Table 2). This system of organizing rural people and resources lasted through to 1978.

4. Current Situation of Chinese Farmer Cooperatives

China started an economic and political transaction in 1978, and central planning of economic activities was gradually transformed to a market-oriented system. A variety of new economic cooperatives have emerged in China since the Household Responsibility System was introduced in 1978. Therefore, the Household Responsibility System with China's economic reform continues to promote the transformation of the rural development. The de-

Table 3 Farmer Specialized Cooperatives in China (2007-2010)

Year	Number of farmer cooperatives	Number of farmers who joined in the cooperatives	Proportion of the total rural households
2007	26,000	2,100,000	—
2008	110,900	12,000,000	—
2009	246,400	21,000,000	8.32%
2010	360,000	28,000,000	10.00%

Source: statistics data, MOA

velopment of farmer cooperatives has entered a new stage, which is totally different with the meaning of “farmer cooperatives” under the collective farming system before 1978.

Since the early 1980s, the centrally-planned agri-food market has gradually been transformed to a market-oriented system. Thus Chinese farmers face a completely new situation. Family farmers could make cultivation decisions by themselves due to become the main body of production, and their enthusiasm for production has greatly been enhanced. But at the same time, farmers have to face some difficulties in accessing appropriate technologies, inputs, information and value-added content of the supply chain, because technological change has demonstrated a predominate role in contributing to agricultural productivity (Huang, J., & Rozelle, S. [21]). The agents of Chinese agricultural extension spent their time on commercial activities rather than on agricultural extension service (Hu, R., Yang, Z., Kelly, P., & Huang, J. [22]). Under such a situation, since the late 1980s, new cooperative organizations — called Farmer Specialized Associations (FSAs) and Farmer Specialized Cooperatives (FSCs) — were established to generate and disseminate agricultural technology among farmers.

In general, the main differences between the two farmer cooperatives are: Farmer specialized associations are non-profitable organizations in charge of providing some technical assistance and sharing information (Yintang Du [23]). The associations are registered at the Civil Affairs Bureau, have no fixed assets, charge no membership fee. But Farmer Specialized Cooperatives are economic entities like cooperatives in western countries which have fixed assets and are in terms of their production, marketing, and processing activities. The cooperatives are registered at the Administration of Industry and Commerce.

Although new farmer cooperatives have made tremendous contributions in improving the degree of farmers’ organizations and become popular among farmers with receiving the strong support from Chinese government until 2006, the legal framework for farmer cooperatives was still missing, and there were still some problems that could not be ignored, especially without missing legal framework for the development of farmer specialized cooperatives. For example, the names, constitution, decision-making mechanism, and the function of specialized cooperatives were not so perfect due to lack of strict rules and charter; the profit distribution between farmers and cooperatives were not explicit; the management of the co-operatives were lack of standardization and democracy, etc.

Based on the above problems, the Law of the People’s Republic of China on Specialized Farmers Cooperatives was adopted on October 31, 2006. This Law is enacted for the pur-

pose of supporting and guiding the development of specialized farmer cooperatives, regulating their organization and behavior, protecting their lawful rights and interests and those of their members, and promoting the development of agriculture and the economy of rural areas. After the promulgation of the Law of Farmer Specialized Cooperatives in July, 2007, the Chinese farmer cooperatives entered into a new stage and presented a situation of fast development benefited from the law. The Law of Farmer Specialized Cooperatives had seemed to become the legal and organizational guarantee for farmer organization and to create a conducive environment. According to the Ministry of Agriculture the People's Republic of China, the number of farmers' specialized cooperatives is 360,000 in 2010 and its membership is 28 million. Looking back at 2007, the number of farmer specialized cooperatives is only 26,000 and its membership are only 2.1 million (Table 3).

However, compared with developed countries, the development of China's farmer cooperatives is still in its infancy and will have wide space to develop. The characteristics of new farmer cooperatives are as follows:

(1) Most Chinese farmer cooperatives are small, and the participation rate of farmers is very low. A rough estimate based on the large village survey sample suggests an average cooperative membership of less than 50 households (Shen Minggao, Scott Rozelle and Linxiu Zhang [24]). As seen in the Table 3, only 8.23% of the total rural households participated in the farmer cooperatives in 2009 and only 10% in 2010.

(2) Chinese farmer cooperatives focus on providing the service just for one agricultural product such as vegetables, fruit, flowers, poultry and aquatic product which have a high degree of marketization and specialization. The main business of farmer cooperatives is to provide services around one agricultural product, including technology and information services, agricultural input supply, and agricultural marketing. But the real deep processing, finishing and other value-added agricultural products can increase very little. By the end of 2009, the farmer cooperatives which mainly provided the comprehensive service accounted for 56%. 8.6% of the total cooperatives focused on providing transportation services and storage services, 5.5% of the total cooperatives focused on providing processing services, 11.6% of the total cooperatives focused on providing information services, and 18.3% of the total cooperatives focused on providing other services (MOA [25]).

(3) Chinese farmer cooperatives are not being uniformly formed across the country. In general, the cooperatives have been developed quickly in the eastern area of China, and slowly in the central and western areas of China. By the end of 2009, the percentage of cooperatives in the ten provinces, Jiangsu, Shandong, Zhejiang, Shanxi, Henan, Hebei, Liaoning, Anhui, Sichuan and Heilongjiang which accounted for 65.5% of the total cooperatives in China (MAO [25]). In addition, six out of ten of these provinces are located in eastern China, three provinces are located in the middle of China, and only one is located in western China.

(4) The financial support to agricultural cooperatives is insufficient. With the development of rural economy and farmer cooperatives, lack of financial support has become the bottleneck for the development of the farmer cooperatives and farmers' income increasing. In

China, agriculture is weak industry due to the natural and market risks. Thus the credit risk is higher in rural areas for rural financial institution. Meanwhile, the major assets of farmer cooperative are agricultural machinery, greenhouse, and livestock or poultry, which is hard to be used as the mortgage and security. Therefore, it is also hard to find a guarantor to provide guarantee for farmer households as well as farmer cooperatives and get the financial support from rural financial institution. From the perspective of financial institution, their products which lack innovation and commercial service reveal another limitation to support the development of agriculture, so the rural financial institution can not meet the diversified financial of farmer households and farmer cooperatives.

5. Main linkages in Agricultural Industrialization in China

With the aim of improving China's agricultural competitiveness, increasing the scale of agricultural industrialization and promoting the modernization of agriculture have been important issues for China's government. Thus industrialization has become a major direction for the development of agriculture in recent years. The organizational form is the carrier of agricultural industrialization. There are three main forms to link Chinese small-scale farmers to access markets, namely, agricultural leading enterprise, intermediary organization, and professional markets. It is reasonable that the agricultural leading enterprises are the major components of industrialization organizations between 2000 (41%) and 2005 (45%), because the Chinese government made great efforts in policy and capital to the development of agricultural leading enterprises (Table 4). Surprisingly, although the Chinese farmer cooperatives showed a huge development potential to link small-scale farmers, they were paid much less attention by policy-makers during this time, especially without a regular basis before 2007. This means that farmer organization and collective action are more suitable for farmers' needs to access markets. Therefore, it is worthwhile to notice that the proportion of cooperatives increased from 14% in 2000 to 36% in 2005 (Table 4).

According to a review of previous studies on vertical and horizontal linkages and the history of Chinese farmer cooperatives, this paper pointed that the farmer organization is a better arrangement to link small-scale farmers and represent the interests of farmers. It is not difficult to understand that the farmer specialized cooperatives are owned by farmer themselves, the benefit of which is closely connected with small scale farmers. On the contrary, the management goal of the leading agricultural industrialized enterprises is to maximize profit rather than serve those farmers. The fact is that, providing the services to the farmer households by some leading enterprises is just an approach to achieve their objective of profit maximization. If there were conflicts with realizing their own interests to farmer households, the leading enterprise will surely reduce or stop those services. Under the great support by Chinese government, the leading enterprises of agricultural industrialization have played an important role in increasing farmer income and developing agriculture, however, they cannot substitute for the farmer cooperatives. Agricultural cooperatives

Table 4 Organization Forms of Agricultural Industrialization in China (2000-2005)

Forms (number)	2000	2002	2004	2005
Leading enterprises	27,276	41,905	49,709	61,268
Percentage	41%	44%	44%	45%
Intermediary organizations	22,146	32,076	41,430	62,914
Percentage	33%	34%	36%	46%
(include: cooperatives)	9,552	20,245	30,546	48,473
Percentage	14%	21%	27%	36%
Specialized wholesale markets	7,674	9,163	10,565	11,543
Percentage	12%	9.7%	9%	9%
The total number	66,688	94,423	113,953	135,725
	100%	100%	100%	100%

Source: "China Agricultural Industrialization Report" [M], China Agriculture Press, 2008

as an important form of farmer organization are still needed in China and should be an intermediate entity between farmers and leading enterprises in order to better coordinate the two sides on the on the interest of farmer.

6. Conclusion

Although there are new opportunities and high profits by participating in such new supply chain as high-value production, a number of studies show that small-scale farmers in developing countries are finding it difficult to access markets and participate in the modern supply chain. Therefore, vertical and horizontal coordination are both necessary for small scale farmers to reduce transaction costs, achieve economics scale, provide support for technology and fund services, and provide the supplies, etc.

This paper argues that a vertical relationship can provide integration between the farmers and the supply chain, but these agribusinesses consider their own profits firstly and set the benchmarks standards to satisfy consumer demand. These strategies can exclude small-scale farmers from the new markets. Due to lack of understanding the market, limited business and negotiating skills, small-scale farmers will be placed on the unfair position in vertical coordination while having a conflict of interests between farmers and their coordinators. Therefore, this paper argues that the farmer organization could be an appropriate governance structure between farmers and other actors in supply chain on behalf of farmers' interests. Moreover, the farmer organization can have a valuable contribution in combining vertical coordination with horizontal linkages. Finally, this paper depicts the history of farmer cooperatives and main linkages in the context of agricultural industrialization in China, and the statistical data shows the rapid development of farmer's specialized cooperatives.

In a word, both theory and evidence from China show that the farmer organization plays an important role to link small-scale farmers to access markets. However, the farmer

cooperatives must be treated as private sector enterprises, and the government's primary role should be to establish a conducive policy environment for their growth, not to control or regulate (Hussi, P., Murphy, J., Lindberg, and Brennerman, L. [26]). But in China, the farmer cooperatives are found by government and not the farmers (Shen Minggao, Scott Rozelle and Linxiu Zhang [24]). Therefore, there are two important issues needing further discussion: (1)Based on the principle of self-governing by farmers for the development of Chinese farmer cooperatives, how to change the leading position from the government to the farmers? (2)How does the emergence of Chinese farmer cooperatives affect farmers' decision-making in the production and marketing?

Notes

- 1) There are many different names used for the same or similar types of organization, such as farmer organization, rural producer organization, agricultural producer organization, agricultural cooperative, farmer association, producer group, and producer association (Bijman, Jos, and Meike Wolni [7]). In this paper, we use the farmer organization to analysis the horizontal linkages among farmers. In China, the farmer organization was called "farmer specialized cooperative".
- 2) The Household Responsibility System (HRS) was the landmark of China's economic transition. The HRS was an agriculture production system, which replaced the People's Commune and unified management of the collective economy by individual household farming units. Under this system, land was reallocated to peasant households according to the number of people in a household by the contract agreement. After fulfilling the procurement quota obligations, farmers are entitled to sell their surplus on the market or retain it for their own use. HRS enhanced incentives for farmers to work in their leased land and promoted efficient production by linking rewards directly to farmers' efforts.
- 3) A "work point" system was used to calculate rewards. All work assignments in the People's Commune are convertible into points, which have different rates of cash value. Each member of the commune is assigned to do the job and accumulate the work points. At the end of the year, according to the accumulated work points, the net income was distributed to each member of the commune during the year.

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