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# The Landscape of Farmer Cooperatives in China: Functions and Diversity in a Changing Environment

**Huan Yang, Cees Leeuwis, Rico Li, and Yiching Song***

# 中国农民合作社的功能与多样性变迁环境中发展现状探讨

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**Abstract**
The agricultural sector and the rural sector in China have experienced fundamental changes from the 1980s onward, and farmer cooperatives have emerged in response to these changes. Beginning in 1990, a series of different policies have been implemented by the Chinese government to promote farmer cooperatives (FCs). This article aims to explore the functioning of FCs on the basis of the type and scope of the services they provide and their connections with the rural communities. The findings show that activities carried out by FCs help to extend farmers' engagement in value-chain participation and management. FCs, as organizational innovations, also provide opportunities to bring knowledge providers and farmers together. Some FCs are starting to coordinate activities for farmers, rural communities and local government to make

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better use of collective resources. Four types of FCs are identified in the research: commodity-based FCs, community-based FCs, specialized technology providers and credit service providers. The emergence of these four types of FCs is embedded in broader institutional developments. The government mainly promotes commodity-based FCs and specialized technology-providing FCs. Companies focus on commodity-based FCs, and research institutes and development organizations are involved in community-based FCs. These findings imply that an integrated and broader view of policies is needed to promote the development of FCs in the long run.

**Keywords**
farmer cooperative, agricultural innovations system, value chain, collective resource management

**摘要**
20世纪80年代以来中国的农村和农业经历了深刻的变革。从20世纪90年代开始，政府出台了一系列的政策推动农民合作社的发展，合作社数量逐步增加。本文意在展示合作社提供服务的类型和范围，以及他们与农村社区之间的联系，并以此为基础探讨合作社的功能发挥。本文研究显示合作社开展的活动有利于农户参与到农产品价值链不同环节以及价值链管理中。合作社作为一项组织创新，也为建立农户与技术提供者之间的联系搭建了桥梁。一些合作社协调农户、农村社区和政府部门之间的关系，实现了集体资源的充分利用。本研究将合作社分为四类：产品型合作社、社区型合作社、专业技术服务合作社和资金互助合作社。这四类合作社的产生根植于外部制度环境。政府主要倡导产品型合作社和专业技术服务合作社的发展。公司致力于产品型合作社的发展，而研究机构和发展组织更多参与到社区型合作社的发展中。这些研究发现意味着政府需要制定更具包容性的政策，加强政策间的一致性，以从长远角度促进合作社的发展。

**关键词**
农民合作社、农业创新系统、价值链、集体资源管理

## 1. Introduction

Over the past three decades, China's agricultural and rural sector has experienced profound changes. From the early 1980s on, when collectively owned land became allocated equally to farmers within each village, farmers started to take responsibility for their own production, purchases, marketing and resource management decisions. Previously, during the People's Commune era, agricultural production had been organized by collective farms under a central planning system. Institutional reform and increased grain production are considered to be the major factors leading to economic development in the early rural reform period (Huang and Rozelle, 1996). However, the tension between the increasing rural population and the decreasing area of arable land rose during this period. The size of the average farm dropped from 0.73 ha in 1984 to 0.58 ha in 2007 (Deng et al., 2010).

At the same time, the agricultural and rural sector in China has encountered the same challenges that prevail elsewhere in the world, while farming is becoming more and more market-oriented. As a consequence of a general improvement of living standards and changing consumption behavior, urban consumers are showing an increased demand for higher-quality food and packaged, processed products. The rapid growth of processors and supermarkets brings challenges as well as opportunities for farmers. Large buyers prefer large and qualified suppliers but offering products of higher value (Chen et al., 2005; Gulati et al., 2005; Hu and Xia, 2007). Increasing public awareness of food safety and the development of relevant certification systems also impose new requirements on agricultural production and offer opportunities for farmers to enter high-value markets (Hu and Xia, 2007). At the same time, farming is becoming more and more dependent on external inputs (including chemical fertilizers, pesticides, modern seeds, and the like), and new farming technologies are becoming more market-oriented (Jin et al., 2010). Intensified agriculture places pressures on vulnerable natural resources and on the environment (Qiu et al., 2008).

New FCs have emerged to meet the above-formulated challenges and overcome problems faced by farmers after rural reform. According to existing studies, early FCs were established in the 1980s; they engaged in facilitating technology exchanges and supplying extension services to members (Han, 2007; World Bank, 2005; Zhang et al., 2007). In the mid- and late 1990s, the number of farmer organizations increased steadily nationwide (RAF, 2004). The services provided by FCs extended to input supply, market information services, marketing and transportation. Beginning in the late 1990s, especially after the implementation of the Farmers' Professional Cooperative Law in 2007, the number of FCs increased dramatically (Han, 2007). According to data from the Ministry of Agriculture (MOA), more than 480,000 FCs were formally registered as of September 2011. They involve more than 38 million farmer households, which accounts for about 15 percent of the total number (MOA, 2011).

Experiences from both developed and developing countries show that FCs can serve multiple functions to meet demands in rural and agricultural development (Chlouplova, 2002; Hellin et al., 2009; Mauget and Declerck, 1996; Rondot and Collion, 2001). This article adopts and integrates theoretical perspectives of value chains, agricultural innovation systems and collective resource management to present a holistic view of these functions. We aim to explore the roles FCs play in a changing environment for agricultural and

rural development. Moreover, we want to know what categories of FCs can be distinguished on the basis of the type and scope of the services provided. Additionally, we reflect on policy implications that result from these findings. After briefly discussing the institutional environment of FCs in China from 1990 on, we examine the functions that FCs serve from those theoretical perspectives. After the section on research methodology, the section dealing with results draws a comprehensive picture of FCs' roles based on empirical data. Finally, the diversity in the landscape of FCs in present-day China is sketched.

## 2. Institutional Environment of Chinese FCs

From 1990 on, the agricultural and rural institutional environment underwent fundamental changes. Looking at emerging cooperatives within China and acting on the experience of Western nations and other Asian countries, the Chinese government gradually recognized the important role that FCs can play in improving farmers' situations in relation to production and marketing. A series of different policies were developed and implemented, and several government departments were involved in different aspects of promoting FCs. Table 1 lists key regulatory or institutional shifts in the development of FCs and shows that different government departments and actors—Dragon Head Firms[1]—partly driven by policies, are involved in the promotion of FCs.

The implementation of the Farmers' Professional Cooperative Law in 2007 is a milestone in the development of FCs. Before that time, it was mainly different government departments and actors that developed policies or actions separately. The China Association for Science and Technology (CAST)[2] focuses on promoting farmers' associations devoted to enhancing rural technological development. The Supply and Marketing Cooperative System (SMCS)[3] and

[1] Dragon Head Firms are agribusiness enterprises recognized by the government at different administrative levels. They have priority in receiving support from the government. The criteria for being labeled a Dragon Head Firm include the number of farmers contracted and services provided to farmers besides product purchasing, such as input and technology services.

[2] The China Association for Science and Technology (CAST) is the largest national organization of scientific and technological workers in China. As a bridge linking the Chinese science and technology community with the Communist Party of China and the Chinese government, CAST is a constituent member of the Chinese People's Political Consultative Conference, where it joins the nation's political parties and other social groups in the state affairs of political consultation, policymaking and democratic supervision (http://english.cast.org.cn/).

[3] The contemporary Supply and Marketing Cooperative System evolved from the national Supply and Marketing Cooperative System established in the 1950s. Now the system is led by the

the Dragon Head Firms play an important role in making it easier for FCs to take part in marketing activities. To stabilize their relationship with farmers, Dragon Head Firms became involved in the establishment of FCs. Governments at different levels started to support Dragon Head Firms as a measure to promote "agricultural industrialization." The cooperation between companies and farmers is usually carried out in the form of contract farming. To stabilize relations between companies and farmers, FCs act as a kind of intermediary to coordinate relations (Zhou and Cao, 2001).

Table 1. Regulatory or Institutional Shifts in the Development of FCs From 1990 on

| Year or period | Motivated by | Regulatory or Institutional Shift |
|---|---|---|
| 1990 onwards | CAST | Encouraged its branches at different administrative levels to set up Farmer Professional Technology Associations (FPTAs) at local level. |
| 1993 | MOA | Became main administrative department in charge of guiding and supporting the development of FCs (designated by the State Council). |
| 1993 | CAST | Carried out a pilot project to support 1,000 FPTAs to demonstrate practical models. |
| 1994 | MOA | Established the Exemplary Charter of Farmers' Professional Association. |
| 1994 | MOA with CAST | Promulgated the document "Strengthen the Support and Direction to the Farmers' Professional Technology Association." |
| Mid-1990s onward | SMCS | Started to facilitate development of FCs to maintain and improve their relations with farmers to sustain their business of input supply and product marketing. |
| Mid-1990s onward | Dragon Head Firms | Became involved in the establishment of FCs to stabilize their relations with farmers. |

China Federation of Supply and Marketing Cooperatives, which is directed by the State Council. The objective of the system is to serve farmers through mechanism innovation to develop farmers' cooperatives (adapted from http://www.chinacoop.com/).

Table 1 (*cont.*)

| Year or period | Motivated by | Regulatory or Institutional Shift |
|---|---|---|
| 2002 | MOA | Supported 100 professional cooperatives, selected from 6 provinces, that carried out information, technology, training, marketing, and product quality certification services. |
| 2003 | CAST | Carried out the project "Top 100 Farmer Professional Technology Associations." |
| 2007 | | The Farmers' Professional Cooperative Law was enacted. |
| 2007 | China Banking Regulatory Commission | Issued the Interim Regulations on Rural Mutual Aid Credit Cooperative, which clarifies the roles that FCs play in the rural finance system. |
| 2008 | MOA with Ministry of Finance | Formulated the Regulation on Finance and Accounting Systems of Farmers' Professional Cooperative. |
| 2008 | MOA and Commerce Department | Carried out the project "Linking FCs to Supermarkets," which created a platform for FCs and supermarket chains to communicate and set up forms of cooperation. |
| 2009 onwards | MOA with ten administrative departments | Carried out the project "Promoting Demonstration Farmer Cooperative," involving all provinces. |
| 2010 | MOA with six administrative departments | Announced the project "Suggestions on Supporting Qualified Farmers' Professional Cooperatives to Take up Publicly Funded Agricultural Development." This further clarified the role of FCs as an entity to represent farmers as a group and its potential in agricultural technology development. |

Since the implementation of the new law, MOA cooperates more closely with other administrative departments in FC policy design and implementation. Support measures, such as linking FCs to markets and involving FCs in agricultural development projects, have become more specific. The scope of support also expands to credit services. However, MOA's cooperation with CAST and SMCS is not clearly identified, although they have initiated a large number of FCs within their own systems. According to 2008 data from CAST, the number of FPTAs at different levels reached 133.6 thousand throughout the country,

incorporating more than 1.1 million farmers (Han, 2007). In 2007, the number of FCs initiated by SMCS reached 36,000 and covered more than 7.5 million farm households (Yuan, 2007).

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Apart from the actors discussed above, many other national and international organizations are involved in FC promotion in China. For example, the China Women's Federation actively participates in promoting rural women's employment and livelihood improvement through microfinance support and in facilitating women's professional associations or cooperatives.[4] The World Bank and the International Fund for Agricultural Development (IFAD) started to support farmer associations or cooperatives in rural development projects as an innovative approach to link farmers into the market or technology systems from the 1990s onward. The World Bank also introduced the Water User Association in China to improve irrigation management in rural areas.[5]

## 3. Theoretical Perspectives on the Functions of FCs

The changes outlined in section 2 leave agriculture situated in an interwoven network that involves consumers, retailers, traders, processors, researchers, governments, and producers. New research paradigms adopting systematic perspectives have emerged in this changing landscape. Value chains and innovation systems are central concepts in today's agricultural research, and with a growing concern for the environment, the relationship between farming and collective resource management is also becoming a key issue. In this section we briefly discuss existing research in these fields and explore the functions that FCs can fulfill.

[4] See www.women.org.cn (in Chinese).

[5] See http://operations.ifad.org/web/ifad/operations/country/projects/tags/china and the *World Bank*'s website about projects in China.

### 3.1 *FCs' Functions and the Value Chain*

The concept of value chain is adopted from research on the globalization of industry and is introduced to agribusiness research to emphasize the intensified flow of information and coordination between different segments and vertical coordination (Gereffi, Humphrey and Sturgeon, 2005). In recent years, some trends can be identified in the value chain structure of the global agrifood market. First, there has been a rise in and concentration of food retailers (supermarkets) and several global food processors (Murphy, 2006). These large buyers have stricter standards concerning the quantity and quality of products supplied by producers (Humphrey, 2005). Second, we can identify a concentration on the input supply side of the agrifood value chain, with large input suppliers maintaining strong control. In general, today's agricultural production uses many materials from outside the local ecosystem, and farmers rely heavily on input suppliers for chemical fertilizers, pesticides, herbicides and seeds to improve their agricultural production (Morgan and Murdoch, 2000). A third trend relates to the introduction of environmental and safety standards in food and agriculture by both the private and the public sectors (Humphrey, 2005; Murphy, 2006).

FCs are seen as playing a decisive role in responding to the above challenges (Rondot and Collion, 2001). Within the agrifood value chain, farmers can explore opportunities by organizing themselves in two ways: (1) being involved in more activities along the chain, and (2) participating in chain management (KIT, HRR and Arusha, 2006). FCs can pool members' purchasing power, achieve larger quantities of products or increase bargaining power (Berdegué Sacristán, 2001; Moustier et al., 2010; Murray-Prior, 2007). Moreover, cooperatives can pool resources to establish entities that could not be created by individual farmers. Since FCs are membership-based organizations, farmers are both owners and users of FC. Bijman and Wollni (2008) argue that this decreases the costs of information collection and in the long run sustains business on the basis of trust between members and the organization. Furthermore, this structure can improve the quality of information as a result of short communication lines.

FCs are also seen to play an important role in enhancing farmers' participation in chain management. One aspect is coordinating farming practices. Emerging standards in the agrifood sector codify more and more complex information and knowledge relating to food safety and environmental and social issues of products and production processes. It is an opportunity for farmers to create a more modular value chain structure if they are capable of standardizing their production accordingly (Gereffi, Humphrey and Sturgeon, 2005). FCs can be supportive to member farmers in standardizing their production.

The other aspect is to coordinate transactions between farmer and buyer. In order to enhance the efficiency of their operations and ensure the quality of products, large buyers tend to build up long-term relationships with producers and enforce stringent requirements on products and transaction processes (Blanc and Kledal, 2012). FCs are helpful in collecting market information for members. They negotiate with buyers, make collective decisions, reduce the costs to individual farmers and help them to make sounder decisions (Bijman and Ton, 2008; Bijman and Wollni, 2008).

### 3.2 *FCs' Functions and Innovation Systems*

An innovation system is considered to be a network of organizations or individuals that demand and supply knowledge and technology focused on bringing new products, new processes and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance (World Bank, 2006). An innovation is a successful combination of hardware, software and "orgware" (Smits, 2002). Orgware refers to the organizational and institutional conditions that influence the development of an invention into an innovation and the actual functioning of an innovation.

FCs can play the role of intermediary in providing favorable conditions for using knowledge in agricultural production processes and for integrating farmers into innovation systems. In China, agricultural extension is called agricultural technology extension, indicating its inherent focus on technology (Gao, 2008). This fundamental focus cannot provide effective solutions for farmers who are facing diversified demands from buyers, decreasing availability of resources and financial constraints. At the same time, privatization of knowledge in agriculture requires the readjustment of relations among the government, the private sector and farmers (Kidd et al., 2000; Leeuwis and van den Ban, 2004). In the last two decades, innovation intermediaries have emerged as new organizations—often in developed countries—to enhance interactions between end users and knowledge providers. These intermediaries were often established in the context of diversification of agricultural production and the privatization of public agricultural research and extension (Klerkx and Leeuwis, 2008). Klerkx and Leeuwis (2009) identified three main roles for intermediaries in supporting the demand for and supply of agricultural knowledge: demand articulation, network brokerage and innovation process management.

FCs can facilitate demand articulation in agricultural innovation systems. Articulation of demand requires initiating a dialogue between users and suppliers to clarify demand and supply (Klerkx and Leeuwis, 2008). FCs can negotiate with actors in the public extension system and voice the problems and

needs of farmers. Such negotiations help to formulate the direction of public extension services, including research, extension and agricultural education, to meet the needs of farmers (Wennink and Heemskerk, 2006). FCs can be significant players in bringing farmers together in innovative networks and promoting user-oriented innovations. FCs are also considered to be efficient in directing funds to farmer-oriented innovation. Both the government and NGOs provide funding for FCs to articulate farmers' demands and search for services from the market (Cristóvão and Pereira, 2004; Currle and Hoffmann, 2004; Rondot and Collion, 2001). In practice, peers turned out to be an important source of information and experience in farmers' networks (Oreszczyn, Lane and Carr, 2010). Through FCs, learning networks can be created for member farmers in which they can better share knowledge on technology and the market (Wennink and Heemskerk, 2006). Wennink and Heemskerk (2006) also note that FCs can establish partnerships with the public and private sectors to advance and guide experiential learning. Hall et al. (2001) have shown that FCs initiate cooperation with several public research institutions to realize marketing objectives.

### 3.3 *FCs' Functions and Collective Resource Management*

Agricultural development is based on natural resources and infrastructures developed and shared by farmers. However, collective resource management always involves situations of social dilemmas and power inequalities. FCs can play a crucial role in these situations by representing farmers collectively and can help to bring discourse on sustainable resource management into practice (Bjørkhaug and Richards, 2008). They can function as a platform for information sharing and collective decision making (Gouët, Leewwis and van Paassen, 2009). Wiskerke et al. (2003) and van der Ploeg (2010) show that cooperatives help farmers develop a shared understanding of their problems and formulating possible solutions for balancing farming and environmental protection. Uphoff and Wijayaratna (2000) demonstrate the success of farmer organizations in water management. Based on vast experience, collectively developed rules are thought to be more commonly agreed upon among members and more effective in implementation than imposed rules (Leeuwis, 2004; Ostrom, 1994, 1999). FCs can also pool members' resources to meet public needs. Esman and Uphoff (1984) note that resource management and resource generation are important dimensions in evaluating the performance of organizations.

FCs can also play an important role in reshaping relations between rural communities and the government. Agrawal and Ostrom (2001) argue that in

developing countries the decentralization of resource management and the introduction of favorable policies for generating self-organization among local groups are supportive factors for success. Wiskerke et al. (2003) show that cooperatives actively interact with the government to increase farmers' room for maneuver in managing natural resources. Uphoff and Wijayaratna (2000) show that it is possible for farmer organizations to attract funds or subsidies from the government. Box 1 gives an overview of the potential functions of FCs, discussed in sections 3.1, 3.2 and 3.3, in relation to value chain, innovation systems and collective resource management.

**Box 1: FCs' Potential Functions**

- Involve farmers in more activities along the value chain, including:
  - Input supply services
  - Processing services
  - Product marketing services
- Promote participation in value-chain management:
  - Improving and coordinating farmers' farming practices
  - Coordinating transactions between farmers and buyers
  - Promoting certification and product quality management
- Provide classic technical extension services
- Articulate farmers' demands
- Assist in innovation-network building:
  - Triggering peer learning between farmers
  - Setting up relations with public and private innovation actors
- Contribute to innovation-process management
- Support collective resource management:
  - Collective rule-making
  - Pooling resources
  - Reshaping relations among farmers, rural communities and the government in resource management

## 4. Research Methodology

This article is based on two sets of data. The first set is the result of a national survey conducted among 173 FCs and carried out by the Center for Chinese Agricultural Policy of the Chinese Academy of Sciences in 2009.[6] This survey

[6] More details of the survey can be found in Deng et al. (2010).

aimed to investigate FC development in China. It was conducted in five provinces from each of China's major agroecological zones. Within each province, counties were classified into three groups by gross value of industrial output per capita, and one county was randomly selected from each group. Within each of the 15 selected counties, townships were divided into two groups—poor and non-poor—again according to gross value of industrial output per capita. One township was randomly selected from each group, leading to a total of 30 townships to be included in the survey. As an administrative entity, each township consists of several villages. The survey then included all villages in the selected townships and interviewed the leaders of these villages using a closed questionnaire. In total, the survey covered 380 villages from 5 provinces, 15 counties and 30 townships. Village leaders who were interviewed were asked whether any farmers in the villages had joined FCs. If the answer was in the affirmative, we traced the FC and interviewed its leader. In total, information was gathered in this way from 173 FCs. In some villages, no farmers were in a FC at that time, and some FCs covered more than one village. The questionnaire asked about the initiation of FCs, their membership, management structure, market-oriented services, technological services, credit-oriented services, finance management and personal information about FC leaders.

Another data set, also collected in 2009, studied 28 FC cases in 15 provinces. The data were collected by the national research network focusing on Supporting FC and Rural Innovation coordinated by the Center for China Agricultural Policy of the Chinese Academy of Sciences and the College of Humanity and Development of China Agricultural University. The member research institutes and universities were asked to provide FC cases considered to be functioning well and, having established relations with local government and village committees, offering diversity in service provision and scale of operation. As many as 46 cases were provided, and 28 were purposefully selected, covering the existing diversity of FCs. Two criteria were used to construct the sample. The first was that the FC's main activities needed to be in the agricultural sector. The second criterion was that information about services provided by the FC be available.

The data from the national survey and the data from the case studies complement each other. The results of the national survey give a general view of the performance of FCs, and the case studies provide in-depth information on services provided.

## 5. Roles Performed by Chinese FCs in Practice

In this section, we use the theoretical perspectives discussed in section 3 to analyze the empirical data from both the national survey conducted in 173 FCs and the 28 FC case studies.

### 5.1 *The Roles of FCs in a Value Chain*

The data presented in table 2 are derived from both the survey and the case studies and show the percentages of market-oriented services provided by FCs. The services are divided into three groups. One group consists of services relating to helping farmers take part in more activities along the value chain. Another group of services relates to promoting farmers' participation in chain management and the third group consists of credit-oriented services. The last column gives a summary of concrete activities as an outcome of the specific services.

Table 2. Percentage of FCs Providing Market-Oriented Services and Their Performance

| | Survey data (n=173) % | Case studies (n=28) % | Performance |
|---|---|---|---|
| Services extending activities in the chain | | | |
| Input supply | 55 | 82 | – Cheaper price, ensured quality of input<br>– Improve and standardize product quality |
| Processing or packaging | 19 | 14 | – Input processing<br>– Food processing<br>– Product packaging |
| Collective marketing | 22 | 36 | – Stabilize relationship with buyers |
| Chain management-oriented services | | | |
| Farming coordination | 65(30)* | 25 | – Control farming process<br>– Collective implementation of certain procedures |

Table 2 (*cont.*)

| | Survey data (n=173) % | Case studies (n=28) % | Performance |
|---|---|---|---|
| Trademark or certification | 15 | 14[4] | – Provide price information<br>– Search for and keeping contact with buyers |
| Coordinating transactions | 40 | 32 | – Product differentiation<br>– Consumer relationship building |
| Credit-oriented services | 7 | 11 | – Credit services<br>– Support activities to make better use of credit |

* The number given here is the percentage of FCs that set criteria for farming procedures. The number within the brackets is the percentage of FCs that collectively implement one or more procedures in farming according to a set of criteria.

The provision of *input-oriented services* is the most common function provided by FCs. Items supplied include chemical fertilizers, pesticides, seeds, young stock and veterinary medicine. Out of the 173 FCs that participated in the survey, 9 do not supply any market-oriented services to members. This partly explains the difference in percentages between the survey data and the case studies. The case studies show that cheaper prices and more ensured quality are achieved as claimed by organizations and members; 82 percent of the FCs demonstrated this performance. This relates to a direct advantage of FCs: larger numbers of farmers lead to increased purchasing and bargaining power, to match the growing input supply in the value chain. One FC established a feed factory collectively and further consolidated its advantage in input supply. This activity is counted as *processing* in table 2. FCs also supply input to members to improve and standardize product quality as well as to reduce costs to members. Of these FCs, 10 supply seeds to members, and some require members to use these seeds as a prerequisite for member farmers selling their products through the FC. Uniform seed varieties supplied by FCs are more reliable and a greater aid in ensuring standardized products. Three FCs explicitly claim that

they provide quality inputs to ensure the safety of products. As safety becomes part of the quality issue, input supply is starting to play a role in pest and weed management, giving farmers easier access and better guidance in the optimal use of low-residue or bio-pesticides or herbicides with, *Collective marketing* and *coordinating transactions*, which help to reduce barriers to farmers' access to the market, involve relatively high percentages of FCs. Ten FCs are marketing collectively to reposition themselves in the market. Bringing members' products together provides the possibility of establishing stable relations with buyers and to some extent increases their bargaining power. In transaction coordination, FCs basically help to collect marketing information and look for buyers, but stable relationships with buyers are not established, and contracts are not signed. For the better-organized FCs, a well-developed information network has been built to update marketing information around the product regularly. Such a network usually extends outside the county and even the province. For newly established organizations with limited experience, marketing information is mainly retrieved from personal relations and is limited to the local market. In some cases, FCs are even further involved in such activities as price setting and product classification. Some of them charge an agent fee, mainly from the buyers, for this process. Members of some organizations prefer this approach over collective marketing because of lower risks and the opportunity to secure a stable income from service fees. Collective marketing by FCs can sidestep the middlemen. It further integrates farmers in the value chain, whereas transaction coordination is based within the existing market structure. Jia and Huang (2011) also note that there has been an increase in contracts between FCs and buyers and that the use of these contracts for stabilizing relationships has intensified.

A large number of FCs engage in *farming coordination* to increase the productivity and quality of products. The survey data show two figures here: 65 percent of the FCs set some standards for members' farming practices, but only 30 percent have control over the implementation of these standards. The case studies show a similar ratio of FCs (25 percent) that enforce standards through field instruction and field checks in farming processes. This reflects the fact that an organization taking action to apply standards is of crucial importance in addition to just having standards. About 15 percent of the FCs provide a *trademark* or *certification* for their products. The survey data and the case studies show similar results here. Trademarks or certifications help to differentiate FCs' products from other products in the market. Products of three FCs from the case studies with a non-pollution food certification or a green-food certification (certification licensed by the MOA) received higher prices,

0.2 to 10 yuan more per kilo compared to the regular market price. FCs can also develop identification of products through another approach. The number in brackets (4 percent) in table 2 represents two FCs engaged in organic production that reach consumers through interactions supported by research institutes and NGOs. By collective efforts in interaction with consumers (for example, field tourism), trust is built and a product's quality can be guaranteed in the long run.

Similar percentages of FCs in the survey and the case studies are reported in relation to *processing and packaging*. One difference is that FCs in the survey are mainly involved in packaging, whereas FCs in the case studies are also involved in processing. One case is the previously mentioned feed factory. Another case is a small sweet-potato-noodle processing plant, which is run by an FC. Another two cases engaged in processing and packaging also have their own trademark and function well in regard to collective marketing. Thus, services listed in the table are not separated but are linked to one another in complex ways. In both the survey and the case studies, 7 percent of the FCs supply *credit-oriented services* to members in two different models. The first model is a joint guarantee from cooperatives that pool funds from members, and from savings in banks.. Members can get credit from the bank under that guarantee. In the other model, the FC gives credit to members from funds provided by the government, NGOs and members' investments. The FCs also provide other services, such as input supply-related services and technology training, to help members make better use of credits.

The above shows that FCs participate in different types of chains, from modern value chains involving third-party certification to short supply chains linking to consumers directly. The most frequently supplied market-oriented services are on the upstream of the value chain, like services oriented toward input supply. In the face of changes in agricultural development, new FC roles are emerging. FCs are starting to provide services in the areas of collective marketing, certification application and brand-identification development. These services help to extend farmers' engagement in value-chain participation and management. However, farmers' participation and benefit sharing become a problem in this process. This is the case with three FCs that are initiated by companies and three FCs that are running under a combined cooperative-company model. Leaders of these FCs are not producers but former extension officials or company staff members. The invested funds come mainly from companies or FC leaders. Relations between farmers and FCs show aspects of contract farming. Farmers follow instructions in production, and FCs purchase products after negotiated prices, without involving farmers in decision making and profit dividends.

### 5.2 *The Roles of FCs in an Agricultural Innovation System*

Table 3 shows the percentage of FCs involved in technology-oriented services. From the survey, we found that 90 percent of the FCs engage in such services. The figure derived from the case studies is even higher: all 28 FCs (100 percent) are providing technology-oriented services. This is in line with the results of the research conducted by Bijman and Hu (2011).

Closer examination of the case studies reveals some notable variations in frequencies. All FCs provide *classic extension services* to members, including introducing new technologies and seeds, providing technology training, disseminating reading materials and providing consultancy. Almost all rely on knowledge providers for these new technologies and information. They collect new technologies and information from knowledge providers and then introduce them to members. The FCs also facilitate direct interaction between knowledge providers and farmer members by inviting experts to give training and field instructions. As most FCs do not charge members for these services and others require members to pay only a small membership fee, the farmers can receive these kinds of extension services at low cost.

Table 3. Percentage of FCs Providing Technology-Oriented Services and Their Performance

| Services oriented toward | Case studies (n=28) % | Performance |
|---|---|---|
| Technology in general | 100 | – |
| Classic extension | 100 | – Collect and introduce technology-relevant information<br>– Provide training, field consultation with knowledge provider |
| Demand articulation | 21 | – Informal procedure to amass members' needs for technology |
| Innovation process management | 7 | – Carry out *in situ* experiments |
| Network building | | |
| Forging peer learning among farmers | 18 | – Organize meetings or exchange visits for experience sharing |
| Setting up relations with public and private knowledge providers | 50 | – Stable relation with knowledge provider for constant support |

Fourteen FCs (50 percent) have stable relations with public extension agencies, research institutions or private companies. However, they have played different roles in the development of their relationships. Three of them took the initiative to establish contact with research institutes. They selected these institutes because they could supply technologies identified as important or promising by the organization. In contrast, the establishment of other FCs' stable relationships was driven by knowledge providers. Three FCs were targeted by companies to facilitate their technology dissemination to farmers. Another eight FCs were encouraged by supportive research institutes to participate in specific technology introduction or by members' demand articulation. Although in these cases FCs are passive in network building, they do play a role in linking individual farmers to knowledge providers. Besides linking farmers to external knowledge providers, five FCs (18 percent) started setting up learning networks within the organization to facilitate information sharing among members. They try to achieve this end by setting up meetings or exchanging field visits. Informal communication in daily interaction among farmers also plays a role in this information network building. Farmers report that peer farmers are an important source of information about technology.

Six cases, or 21 percent of the FCs, engage in *demand articulation*. For these FCs, this is not a formally organized process that follows pre-set procedures. It is loosely based on daily communication between members and FC leaders or staff. Most of the solutions offered to farmers are based on existing information or technology. Where no existing information or technology is available, demands are framed as research issues. Two FCs participate in an innovation process in the form of *an in-situ* experiment. One FC is host to an experiment on the appropriate amount of fertilizer in organic rice production. This experiment is supported by a research institute. The other FC participates in integrated maize production. This experiment is managed by a research institute. It is further observed that the activities of FCs are often motivated by external actors. FCs seldom initiate an innovation process by themselves.

From the findings it is interesting to see that FCs, as an organizational innovation, offer opportunities for bringing knowledge providers and farmers together. However, the findings also show that the role of FCs at the level of the agricultural innovation system is limited and that FCs mainly operate at local levels. In most FCs, the capacity for network building and setting up a research agenda is rather weak and their functioning in agricultural innovation highly depends on intervention and support from external actors.

### 5.3 *The Roles of FCs in Collective Resource Management*

The case studies show that some of the FCs play a role in collective resource management (see table 4). The services provided in this regard relate mainly to *pooling resources* for infrastructure development and management. Eight FCs (29 percent) fall into this category. They are involved in road construction, irrigation infrastructure building, greenhouse building and livestock-farming area development, which help to make better use of resources like water and land. Three FCs, operating in the field of greenhouse building and livestock-farming area development, developed collective production areas with a better road infrastructure and an improved water supply. In order to accomplish this, the three FCs needed to negotiate with the village committees for the right to use the collective land of the villages. If the production area was not being developed for all farmers in the village, the FCs also needed to reach agreement with participating farmers to pay rent for the use of the land.

Another case—a water-users association—demonstrates the effectiveness of FCs in practice. This association was set up for the decentralization of water management at the county level and has branches at township and village levels. The FC is responsible for water supply and the management of the irrigation system. A basic rule within the association is that the formulation of regulations and the change of regulations should obtain consent from at least 70 percent of the members.

Table 4. Percentage of FCs Involved in Collective Resource Management

| Services oriented towards | Case studies (n=28) % | Performance |
|---|---|---|
| Collective rule making | 4 | – Collectively develop and change rules for resource management |
| Pooling resources of members | 29 | – Mobilize members to invest money and labor |
| Reshaping relations between farmers, rural communities, government and other external organizations | 29 | – Active in articulating farmers' demands and report to government and other external organizations<br>– Coordinate farmers and villages in collective resource management |

The eight FCs also coordinate relations among farmers, government, research institutes and banks to mobilize resources for infrastructure development and maintenance. This coordination always involves large investments of resources, including funds and labor. Six FCs requested the government or a research institute to invest in local small-scale infrastructure, including roads, irrigation channels, collective shelters for cattle and the organization of offices. All showed their commitment to the projects by investing labor, while three also invested funds. Two FCs help their members to get bank loans through a collective FC guarantee system.

## 6. Exploring the Diversity of FCs

### 6.1 *A Typology of Existing FCs*

The results presented in section 5 demonstrate the variety in services provided by FCs in China. In this section, we look at the patterns in combinations of services provided by FCs, using data from the case studies. Some FCs focus mainly on one domain or label themselves as one kind of cooperative. Two FCs engage mainly in technology improvement in farming practices and can be classified as *specialized technology service providers*. This is a small number compared to the total number of FCs, who somehow provide technology services but not in a specialized way. When we study the development of services provided by FCs, we can identify a clear path showing some FCs developing from *a single service organization* to *a multiple services organization*. It seems that there is a recognition that one service provided by one organization cannot fully solve farmers' complex problems in agricultural production and that complexity needs to be approached in its totality. A representative example of this can be found in box 2. There are two FCs labeled as *credit service cooperative* because they have received a formal finance business license from the government. Because the new regulation legitimizing FCs' participation in rural finance markets was implemented in 2007, the FCs focusing on credit services are just emerging, and the number is also small at the national level (see table 2).

Most FCs try to overcome farmers' complex problems by providing multiple services. In the case studies, two different approaches can be found in dealing with this complexity. The first approach focuses on improving one or several products to increase the income of those farmers who are involved in the production of these specific products. Services that are then provided include tailor-made technical services, market-oriented services and financial services.

**Box 2: Moving to Multiple Service Organizations**

Two organic-rice associations are located in the traditional rice-production area of Guangxi Autonomous Region in Southwest China. They have been established by farmers who engage in organic-rice production under the support of an organic-products promotion project coordinated by the Guangxi Maize Research Institute (GMRI) and funded by Participatory Community Development (PCD), an NGO in Hong Kong. The associations were set up to bring together farmers and project staff for technology development. This included organizing training activities, sharing experiences with peer farmers and carrying out local experiments. In the first year and a half of its function, members were satisfied with the associations' contributions, and more farmers accepted the idea that organic products are healthier and friendlier to the environment. The number of members increased from 5 to about 25 for both organizations.

At this point, the associations found it difficult to attract new members. Members complained that they had invested in more labor but could not get higher prices and had to settle for lower crop yields. From 2007 onward , the associations started to market their products with the help of GMRI and PCD. They invited consumers to the villages for field-experience visits and held meetings with consumers in cities to introduce their products. By 2010, both organizations had established long-term relationships with consumers in Nanning, Liuzhou and Hong Kong. Their rice is now recognized as organic among these consumers and attracts twice the price of ordinary rice. In some seasons, their rice could not meet the increasing demand of consumers. The associations have covered all farmers in the initial villages and are extending their activities to other villages.

The second approach tries to promote agricultural development in one area as a whole (usually within a community). This is done from different angles, such as general improvement of agricultural production, income generation, social well-being of residents and the management of common resources. In this article, we classify cooperatives taking the first approach as *commodity-based FCs* and cooperatives taking the second approach as *community-based FCs*.

On the basis of the above discussion, four types of FCs can be distinguished: *specialized technology service providers, credit service providers, commodity-based FCs* and *community-based FCs*. Table 5 indicates the distribution of FCs according to the services provided by each type. Commodity-based cooperatives and community-based cooperatives seem to be similar in trying to combine different kinds of services and creating compatibility between them, but they do show differences in the kinds of services they combine and provide.

Table 5. Classification of FCs and Services Provided (Based on the Case Studies)

| Services oriented toward | Commodity -based FCs | Community -based FCs | Specialized technology service providers | Credit service providers |
|---|---|---|---|---|
| *Total number of FCs (n=28)* | 17 | 7 | 2 | 2 |
| Market-oriented services | | | | |
| Input | 16 | 5 | 1 | 1 |
| Processing | 0 | 1 | 0 | 1 |
| Collective marketing | 6 | 4 | 0 | 0 |
| Farming coordination | 1 | 5 | 0 | 1 |
| Trademark or certification | 2 | 2[2]* | 0 | 0 |
| Coordinating transactions | 7 | 1 | 0 | 1 |
| Technology-oriented services | | | | |
| Classic extension | 17 | 7 | 2 | 2 |
| Demand articulation | 2 | 3 | 1 | 0 |
| Innovation process management | 0 | 1 | 0 | 0 |
| Network building | | | | |
| Forging peer learning among farmers | 2 | 3 | 1 | 0 |
| Set up relations with public and private knowledge providers | 9 | 5 | 2 | 0 |
| Collective resource management | 1 | 6 | 0 | 1 |
| Credit-oriented services | 0 | 1 | 0 | 2 |

* The figure between brackets represents the percentage of FCs that do not have a legal trademark or certification but whose products have an established reputation among consumers.

### 6.2 *Examples of Different Types of FCs*

Table 5 showed that different types of FCs follow different patterns in providing services in terms of the key functions discussed in section 5. In this subsection, we present an example for each type of FC to demonstrate specific characteristics in practice. It is helpful to better understand the different roles FCs play and the different contexts in which they operate.

**CASE 1: The Yangliu Technology and Community Development Association: A Specialized Technology Service Provider**

The Yangliu Technology and Community Development Association is located in Yangliu, a town in Yunnan province. It is a mountainous and poverty-stricken area, characterized by limited access to farmland, agricultural knowledge and technology. In 2000, the Yangliu Technology and Community Development Association was established as a NGO under the promotion of a rural development project funded by the provincial Science and Technology Committee and the Ford Foundation and facilitated by the Center for Regional Development of Yunnan University. The association operates at two levels. The first is the town level, composed of staff from the town government office and other government agents. The second level of operation is the village level. This level is composed of leaders and members from the villages and operates through technical support groups (18 groups in total). The association collects farmers' technical demands, provides relevant knowledge and technology services, helps the groups to collect funds for relevant projects and assists in making and implementing a community development plan.

Each technical support group develops its own projects with the support of the association. The technical support group in Jiangjing village, for example, stimulated pig breeding in the village. Before the establishment of the group, 8 households had only 14 sows in total, and 80 percent of the piglets for fattening were bought from outside. In 2008, 31 households were engaged in pig breeding, and together they had produced more than 1500 piglets a year. This increase was the result of two support measures from the association and the group. On the one hand, the association and the group facilitated access of the farmers to the services provided by a pig feed company. Farmers changed from home-cooked feed to uncooked feed and learned how to use the formula that was supplied by the company. On the other hand, the group provided small amounts of credits that were provided by the association to households to help them to start production or increase the scale of production. The members of the group also got a chance to exchange their experiences of pig breeding and pig fattening through this platform.

The association also established a network with other public technical departments to collect information about new technologies and to help farmers evaluate new technologies. For example, the association introduced a new pumpkin variety and provided relevant technical services to the groups who wanted to join the project. The association also cooperated with the provincial research institute to introduce and experiment with new maize varieties

to select the ones that could adapt to the local climate. According to the self-evaluation of the association, the groups and the farmers not only acquired new knowledge and technologies through the association's activities, but also significantly improved their capacity to search for new technologies and their management skills.

### CASE 2: The Baixin Credit Cooperatives: A Credit Service Provider

The Baixin Credit Cooperatives is a group of cooperatives located in Lishu County, Jilin Province. One of the major functions is to provide credit services. The cooperatives that are part of the group emerged from the needs of local farmers. They have developed by adopting different operational models that are being disseminated all over China.

After the implementation of the Interim Regulations on Rural Mutual Aid Credit Cooperative, one of the cooperatives, called the Yanjia Baixin Credit Cooperative became the first credit cooperative to gain formal recognition by the national government. The establishment of this group of cooperatives has received strong support from outside, especially from Jiang Bolin, an expert working in the local branch of the China Banking Regulatory Commission. From 2000 onward, he used his professional knowledge to help farmers to develop regulations for credit cooperation and mobilize resources to provide training for farmers in cooperative management and credit cooperation. The China Industrial Cooperation Association is one of the major supporters of the training.

The cooperatives provide their credit services in two principal ways. One is by directly providing small amounts of credit to members from their own funds. These funds come from the savings of members and loans with lower interest from other commercial banks or financial institutions. A series of rules, based on the exemplary chart of credit cooperatives provided by the China Banking Regulatory Commission, regulates the members' investments and borrowings. Basically, only members who invest in the cooperative have the right to get credit, and the largest amount that can be borrowed is ten times the members' investment. The chart used by the Yanjia Baixin Credit Cooperative has become an important model for other credit cooperatives all over the country.

The other way is saving members' shares in the local Rural Credit Cooperative[7] as guaranty money for members who borrow money from the Rural

[7] The Rural Credit Cooperative was established in the 1950s by the People's Bank of China to provide financial services to rural areas. After the rural reform and financial market reform, it was transformed from a state-owned bank to a commercial bank.

Credit Cooperative. This is the major source of credit for farmers. Before the establishment of the Baixin Credit Cooperatives, information asymmetry was a problem between the farmers and the Rural Credit Cooperative. The cost to the bank for collecting information about individual farmers is high, and the farmers are disadvantaged by the dominance of the bank when they go through the whole process of borrowing. By the intermediation of the credit cooperative, farmers have easier access to credit, and the bank can better control the risk for the larger amount of guaranty money put in the bank. The Lijia Baixin Credit Cooperative has adopted this model.

Besides credit services, all the Baixin Credit Cooperatives are involved in agricultural development projects to help farmers make better use of credit. Taking the Lijia Baixin Credit Cooperative as an example, it has mainly invested the credit in pig production. When the cooperative was established in 2001, eight members invested 3,000 yuan and got 70,000 yuan in credit from the Rural Credit Cooperative. With the money, the cooperative started the collective purchase of pig feed and lowered the cost of pig production. In cooperation with a processing company, the members got higher prices. The success attracted more farmers, and investment by the individual members also increased. Now the cooperative has 36 members and an investment of 640,000 yuan from these members. At the same time, the cooperative purchased and built new fixed asserts, like a feed processing facility, to provide more services to its members.

### CASE 3: The Sister Chu Melon Cooperative: A Commodity-Based Cooperative

The Sister Chu Melon Cooperative is located in Jiaxing, Zhejiang Province. The cooperative is about a 50-minute car drive from Jiaxing City, and farming is the major source of income in this area. Before the establishment of the cooperative, local farmers already had more than ten years' experience in melon production. In 2005, the initiator of the cooperative, Miss Chu, who was a melon producer and at that time the chairman of the party branch in the village, learned about FC promotion policy from a government meeting in town. She shared the information gained from this meeting with the eight melon farmers in the village, and seven of them agreed to set up a melon cooperative. In 2006, the cooperative was formally established and registered. In 2012, the cooperative had 150 members from the village and nearby area.

The cooperative provides a series of services in melon production, including input supply, technical support, processing, storage and marketing services.

The cooperative got the hazard-free certification[8] for the melon production field in 2007, and their application for green food was approved in 2009. In order to improve and ensure the quality of the product, the cooperative requires its members to follow its own standards in the production process. At the season of planting, fertilizing and pest management, the cooperative organizes trainings for its members. To share Miss Chu's experience in melon production, in 2011 the cooperative also opened a Weibo-account. Weibo is an online social network application similar to Twitter, used to provide updated information about seasonal farming operations and to interact with its members.

The cooperative also develops technologies according to the local context. For example, the cooperative developed the "rice-melon" rotation model. With the application of greenhouse technology, melons can be planted from December to June in the year after the harvest of late rice. The rotation with rice not only makes it easier to control disease and pests, but also improves the quality of the melons. To increase their income, the farmers can also harvest about 500 kg rice per mu.[9] The cooperative also provides services concerning rice production, processing and marketing to encourage members to adopt the technology.

In order to distinguish its products from other melons in the market, in 2006 the cooperative obtained the trademark *Sister Chu.* It has built stable relations with the Jiaxing agriproducts wholesale market, and the melons are sold to several big buyers. Sister Chu is now widely recognized as the trademark from Jiaxing, and annual sales have reached 10 million yuan a year.

### CASE 4: The Gengguantun Cooperative: A Community-Based Cooperative

The Gengguantun Cooperative is located in Gengguantun village, Hebei Province. It provides technical and marketing services to all the farmers in the village and has close relationships with the village committee. These characteristics make it a typical example of a community-based cooperative. The cooperative is involved in the production of multiple products, including Chinese dates and several kinds of cereals, vegetables and eggs. It was initiated in 2006 by a village woman, Miss Song, who had a lot of experience in Chinese date production and marketing. Realizing that a good product will not fetch

[8] Hazard-free certification is one of three public certifications in China under the administration of the Ministry of Agriculture. The other two are organic and green certifications. Hazard-free is the basic requirement that allows use of artificial chemicals but in a limited amount and of a certain type only. The first regulation on hazard-free certification was implemented in 2001.

[9] 1 mu = 1/15 ha

a good price without classification, she started to classify and pack the products of good quality. After several years of exploration, she had built a network of supermarkets and hotels for her product, and farmers in the village gained access to these markets through her.

In this situation, the leader of the village committee, Mr. Pan, urged Miss Song to establish a cooperative to provide technical and marketing services to all the farmers in the village. An agreement was made that the cooperative rent infrastructures from the village committee at half the market price and that the cooperative include all farm households (about 1,000) in the village as members. The infrastructure covers an area of 1 ha, including offices, three processing workshops, one exhibition room and two agriproduct storages. The cooperative has three types of members. The first type consists of shareholding members, who have the responsibility to share market risks and the right to receive dividends from the profits. About 30 farmers are invested in the cooperative. The second type consists of contract members who adhere to the production standards of the cooperative and receive higher prices for their products. They have the right to decision making, to vote and to stand for election, but they do not have the right to claim dividends. About 400 farm households fall into this category. The third type consists of regular members who can receive technical training, input supply and farm machine services at lower prices but who do not market their products through the cooperative.

The cooperative signs contracts with contract members in terms of the cooperative's requirements about the production process and product quality, the procurement price and the relevant services provided by the cooperative. For example, the cooperative requires that its members use the fertilizer and pesticide provided by the cooperative to control food safety. Members can also receive better prices for better quality. For instance, the price for a special variety of maize is 2.6 yuan/kg, while the market price for ordinary maize is 0.8 yuan/kg. To ensure product quality, the cooperative invites experts from extension agencies to give training before the production season. The extension agents inspect the production field regularly and provide consultation services during production. They also organize the harvest to ensure the purity of such products as wheat. The cooperative does not make any profit from the input supply services to both contract members and nonmembers. All the farmers in the village benefit from the cooperative to a different extent, depending on the kind of participation.

The cooperative collectively markets all products under the same trademark—Gengguantun (the name of the village). The trademark is owned by the village committee and authorized to be used for free. The products are sold in

supermarkets, stores and exclusive shops, both locally and in large cities, such as Beijing and Tianjin. Any profit becomes the main source for the cooperative's capital accumulation. According to an investigation by the College of Humanity and Development of the China Agricultural University, this practice also motivates the share-holding members to invest.

Following the establishment and stabilization of the marketing network, the cooperative started to diversify its products and to develop ecological agriculture to make better use of the resources in the village and strengthen its market position. At the beginning, the cooperative mainly engaged in Chinese date and cereals production and marketing. Now it has extended to vegetable production, poultry and egg production and wheat flour processing. It also experiments with wheat and maize varieties to improve productivity and flavor. Taking wheat production as an example, the cooperative provides seeds to farmers and commits them to only use organic fertilizer as a base fertilizer and to only use pesticides provided by the cooperative. In processing, it uses the improved traditional stone mill to preserve the traditional flavor. The flour is welcomed at the local market, and the demand exceeds the supply because of limited processing capacity.

### 6.3 *Characteristics of Different Types of FCs*

Based on the findings from the case studies and the cases presented above, the characteristics of the different types of FCs are summarized in table 6. As shown in section 6.1, multifunctionality is the trend for FC development. It is interesting to compare the different approaches that combine different services and are adopted by community-based and commodity-based FCs. Community-based FCs, as compared to commodity-based FCs, engage more deeply in farming coordination and collective resource management. As already discussed, community-based FCs are essentially territorially based and devoted to the development of the area. This leads to some differences from commodity-based FCs. Firstly, community-based FCs claim that they serve the whole village, and membership is open to all farmers in a village. Members of the organization are known to one another, and members' lands are located close to one another. Because of this social and territorial proximity, farming coordination is relatively easy to implement. Secondly, community-based FCs have a greater chance than commodity-based FCs of receiving support from village committees in the form of offices and financial or personnel support as their contribution is more relevant to village development. In some cases, the FCs also organize cultural activities in the villages. Thirdly, community-based

Table 6. Characteristics of Different Types of FCs

| Type of FC | Characteristics |
|---|---|
| Commodity-based FC | – Organized around products, and tending to focus on a single product<br>– Open membership without restrictions on the location of members<br>– Limited involvement in collective resource management and farming process management<br>– Membership open to farmers in the village<br>– Shares public resources with or receives support from village committees |
| Community-based FC | Engagement in multiple products based on community resource endowment<br>– Participation in common-pool resource management and public services |
| Specialized technology service provider | – Mainly provides technology-oriented services to members and relevant input services to realize the use of new technology |
| Credit service provider | – Mainly provides credit services to members and provides relevant support to make better use of the credit |

FCs tend to engage in multiple products, including crops and livestock. Recognition from village committees and farmers for their multiple services legitimize their role in collective actions in the village, including natural resource management.

Comparatively, commodity-based FCs engage more in coordinating transactions and less in resource management and farming coordination. Some similarities can be found among these commodity-based FCs. Most commodity-based FCs are organized around one product; 14 out of the 17 commodity-based FCs fit this principle. FCs motivate farmers to collectively produce one and the same product without restriction on location of members. In this way, the quantitative needs of large buyers or of regular supply can be met. Quality improvement is also an important part of organizational activities, and FCs mainly achieve this through input management and product selection rather than engagement in cultivation process management.

Looking back to the institutional background of the development of FCs in China, we can find a correlation with the diversity of FCs. Table 7 indicates the

Table 7. Initiators of FCs

| Initiator | Survey data (n=173) % | Case studies (n=28) | | | |
|---|---|---|---|---|---|
| | | Commodity -based FCs | Community -based FCs | Specialized technology service providers | Credit service providers |
| Farmer | 73 | 9 | 3 | 0 | 1 |
| Government | 31 | 3 | 1 | 2 | 0 |
| Company | 16 | 5 | 0 | 0 | 0 |
| Research institute | 1 | 0 | 3 | 2 | 0 |
| NGO | 0 | 0 | 1 | 1 | 1 |

***Note***: Figures in each column are not mutually exclusive.

number and percentage of different actors involved in the initiation of FCs. The heavy involvement of the government in the initiation of FCs reveals the strong governmental influence on the development of FCs. This is also noted by Deng et al. (2010). From the case studies we learn that the government is mainly involved with commodity-based FCs and with specialized technology service providers. Closer examination reveals that the Agricultural Bureau and CAST, operating at the local level, are the principal governmental agencies engaged in the process. They mainly provide technological support to FCs. Companies are important players in the establishment of commodity-based FCs. This involvement is directly linked to the objective of smoothing transactions with farmers. Other organizations, including research institutes and NGOs, are also involved in the initiation of FCs, but not the commodity-based type. These research institutions and local NGOs cooperate with international development organizations, such as IFAD, International Development Research Center, Canada (IDRC), and share the idea that rural development should cover economic, social and environmental aspects.

## 7. Policy Implications

Beginning in the 1990s, the Chinese government developed a series of policies to promote the establishment of cooperatives. Different actors have been involved in the development process, including government departments, companies, research institutes, NGOs and international organizations. The

findings above carry some policy implications for stronger support of FCs and making better use of FCs to promote long-term sustainable agricultural and rural development.

Firstly, more compatible and synthesized policies could enhance the FCs' functioning because most FCs serve multiple functions in different combinations. This consideration can be understood from two angles. On one hand, considering the effectiveness of existing policies, the policies discussed in section 2 were designed and implemented by different government departments with different objectives. This does not only decrease the compatibility of policies at a higher level but also increases the difficulties for FCs to access and integrate resources from different government agencies at the local level (Tong, 2008). MOA has started to cooperate with other departments in order to develop more comprehensive policies, but it remains to be seen if this cooperation will lead to an improvement in serving the diverse functions of FCs in practice. On the other hand, in terms of the recognition of different functions of FCs, the formal recognition of government policies could encourage the FCs' participation in providing relevant services. This can be inferred from the wide coverage of marketing and technical services among FCs under the strong support from the government. The significance of multiple function organizations lies in the fact that different functions can enhance the performance of each other as shown in the cases for different types of FCs in section 6. The success of innovation in agricultural development depends on the appropriate combination of resources, knowledge, technologies and organizational structure (Leeuwis and van den Ban, 2004). Collective resource management is one of the functions that have not been well recognized in current policies. The Water Users Association has been introduced to facilitate the water and irrigation management in the rural areas with the promotion of the World Bank and other international and national organizations (Tong, 2005), but the scope and extent of FCs to engage in resource management is limited.

Secondly, the emergence of different types of FCs, especially the community-based ones, challenges the view of the government about the role of FCs' in rural and agricultural development. The current model promoted by the government focuses on cooperatives that are organized around commodities. This approach might not fully reach the objective of promoting the equal development in rural areas. Some farmers are excluded from the cooperative activities because they have limited capacities and resources to specialize in certain agriproducts. The wide coverage of community-based FCs' membership helps to solve this problem by providing basic services to all farmers within the particular FC's territory of operation. Support from collective or

public organizations is an important motivation for the FCs to provide services to benefit all farmers.

At the same time, the commodity-based model mainly gained success in North America, where agriculture is dominated by large-scale and monoculture farming. The farming system in China consists of millions of small farms and is characterized by diversity within each region. Hence the cost for public extension agencies to reach all the farmers and the costs for individual farmers to get appropriate services are high. The wide coverage of community-based FCs helps public extension agencies to reach large numbers of small farmers and improve their performance.

Taking the multiple functions of agriculture into consideration, the specific territorial connection that community-based FCs have is an important characteristic for getting engaged in resource management. Because of the depletion of different kinds of resources, such as fertile land and water, sustainable resource management is important to reorient agriculture in China (Qiu et al., 2008). Considerable experience from other countries show that collective action and farmer cooperatives can contribute to the sustainable use of resources for the wide involvement of local people from the same region when the government leaves enough room for them to maneuver (Agrawal and Ostrom, 2001; van der Ploeg, 2010).

Based on these arguments, some researchers maintain that the models in Japan, South Korea and Taiwan, based on traditional and geographically defined rural boundaries are more appropriate in the context of China (Wen, 2010; Yu, 2007a, b). They engage in public resource management, insurance services and social activities besides focusing on market-oriented activities (Choi, 2006; Klinedinst and Sato, 1994; Lin, 2006). The community-based FC classified in this study is similar to this model. The model does not exclude the community-based FC, but integrates these two types to serve different functions. Taking the FC system in South Korea as an example, it is constituted by the regional cooperatives that are made up by farmers in the region and commodity cooperatives that are made up by farmers specialized in one cash crop or livestock (Hong, 2004). At the same time, these two types of FCs, especially the community-based one, integrate the resource management and credit services into other services directly related to agricultural production. Hence, a more sophisticated policy on FC promotion is needed for the Chinese government to balance the development in both the short and the long run and to ensure an equal benefit for farmers and environmental sustainability.

## 8. Conclusion

This article has given a general picture of the diversity to be found in FCs in contemporary China and the services they provide in responding to changes and challenges in agricultural and rural development. In market-oriented services, FCs most frequently supply services upstream in the value chain, like input supply, and start to focus on collective marketing and farming coordination; they are also beginning to become involved in certification issues and brand identification. These activities are helpful in extending farmers' engagement in value-chain participation and management. In terms of technology-oriented services, FCs offer opportunities to bring knowledge providers and farmers together as an organizational innovation, but they mainly operate at local levels and play a limited role at the innovation system level. Considering collective resource management, some FCs are starting to coordinate activities for farmers, rural communities and local governments to achieve better use of resources, such as land and water, and to develop infrastructure for rural communities. Within each kind of function, different FCs adopt different approaches, such as between modern value chain and linking to consumers directly or introducing external knowledge and developing contextual knowledge.

Four types of FCs can be distinguished, depending on the different services they provide and their relationship with rural communities. There are commodity-based FCs, community-based FCs, specialized technology providers and credit service providers. The emergence of these four types is embedded in broader institutional developments. The government mainly promotes commodity-based FCs and specialized technology providing FCs. Companies focus on commodity-based FCs, whereas research institutes and development organizations are involved in community-based FCs.

Current government policies do not fully recognize the multiple functionality of the FCs and the importance of community-based FCs in long-range agricultural and rural development. More sophisticated policies that integrate different support measures and cover more functions could contribute to the further development of FCs in the future.

In the development of FCs, positive efforts can be identified, but negative sides are found as well. More detailed insights are needed on the everyday performance of the different types of FCs. We would like to know whether they perform differently as intermediaries between farmers and the external world. It is also important to look at the relation between internal and external dynamics and their influence on the functioning of FCs.

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