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## CASE STUDY

# A hybrid form of agricultural organization: the case of the Beizhijiang vegetable cooperative in China

Qiao Liang<sup>a</sup>, Weibin Hu<sup>b</sup> and Fu Jia<sup>Ⓢ</sup>

<sup>a</sup> Associate Professor, <sup>b</sup> PhD Student, China Academy for Rural Development, School of Public Affairs, Zhejiang University, 866 Yuhangtang Road, 310058 Hangzhou, China P.R.

<sup>c</sup> Professor, The York Management School, University of York, Heslington, York YO10 5DD, United Kingdom

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## Abstract

Farmer cooperatives in China have been developing a hybrid form of governance with features that are seldom observed in other countries. The Beizhijiang vegetable cooperative (hereafter BZJ cooperative), which was founded in 2009, is a case in point. The chairperson of the BZJ cooperative has dominant control over the decision-making and income rights of the cooperative and is also president of the Pangu corporation, a downstream buyer of BZJ products. The purpose of this case study is to allow students to understand the special form of the cooperative in a Chinese context and to compare it to the International Cooperative Association principles regarding cooperatives. This article is aimed at senior undergraduate and graduate students in agribusiness management and agricultural economics and has practical value for agricultural enterprises and related governmental departments.

**Keywords:** farmer cooperative, agribusiness, China, governance, hybrid form of organization

**JEL code:** Q13

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<sup>Ⓢ</sup>Corresponding author: [fu.jia@york.ac.uk](mailto:fu.jia@york.ac.uk)

## 1. Introduction

Mr. Zhang, chairperson of the Beizhijiang vegetable cooperative (hereafter BZJ cooperative) and president of the Pangu Ecological Agricultural Development Co. Ltd. (hereafter Pangu corporation), sat at his desk talking about his plans for the future.

*We want to build a farm gate marketplace and a farming park (agricultural tourism, authors). The park would be comprehensive and would contain a farming culture expo, a technology demonstration, a planting and breeding exhibition, a recreational area for kids, and perhaps food services as well....*

It has been eight years since the establishment of the BZJ cooperative and six years since the foundation of the Pangu corporation. After achieving stable operation and profitability, Zhang began to aspire to move the development of the cooperative and the corporation to the next stage. Zhang looks confident and hopeful while talking.

The BZJ cooperative was established by seven farmers, including Zhang, in June 2009 in Fu Chun Jiang village in Fuyang, Zhejiang province and currently has 120 members. The cooperative pooled and reorganized local farmers' farm land and redistributed to members to reduce fragmentation. It is one of the pilot cooperatives recognized by the Zhejiang provincial government, which is one of the forerunners in the development of farmer cooperatives in China. The Pangu corporation was founded in 2011 by Zhang and his family, who are also the largest shareholders of the BZJ cooperative; main business of the corporation is distribution, i.e. the purchasing and marketing of vegetables.

Zhang is an entrepreneur who initiated the establishment of both the cooperative and the corporation. After graduating from high school in 1996, Zhang worked in a construction company for 5 years. Then, he attended college through a long-distance learning course in 2001 while working for a material recycling company. After leaving college, Zhang started his own business processing and selling wooden products; the business ended in 2008 due to low profitability. In 2009, Zhang began to promote the circulation of farmlands in local villages and the foundation of the BZJ cooperative because he was optimistic about business opportunities in agriculture and expected more preferential policies for agricultural production.

Nearly 75% of the shares of the cooperative are controlled by Zhang and his family (including his father and younger brother). It is not unusual for a cooperative to be controlled by a corporate shareholder or a member of the elite in China for cultural and historic reasons, although internationally, a cooperative generally must follow the International Cooperative Association (ICA) principles to be recognized.<sup>1</sup> Voices from both the public and academia have suggested that cooperatives in China should be restructured to avoid the kind of organization that disadvantages common members (Liang and Hendrikse, 2013).

It seems that for Zhang, the decision regarding whether to maintain or cut down the dominant shares of the cooperative is straightforward; however, it is not as easy as it appears. For example, if the government tightens the policy on cooperatives, e.g. by creating strict requirements for how a cooperative is defined, Zhang would face the challenge of whether to continue investing in the cooperative or to withdraw from it. As it stands, the cooperative provides protection for the common members against market fluctuations; it also helps Pangu and Zhang receive funding from the government, provide training to the members and ensure a stable supply of vegetables from the farmers. Zhang appeared slightly concerned about the future of the cooperative and asked us many questions about government policies. Here begins our story.

<sup>1</sup> ICA cooperative principles are (1) voluntary and open membership; (2) democratic member control; (3) member economic participation; (4) autonomy and independence; (5) education, training and information; (6) cooperation among cooperatives; and (7) concern for the community. For more detail: <https://tinyurl.com/yc77lg9p>.

## 2. Farmer cooperatives in China

Cooperatives, a special type of organization characterized by member ownership, member control, and member benefits, exist widely in agriculture. The objective of cooperatives is to maximize the economic and non-economic benefits for the members, in contrast to the objective of investor-owned-firms to maximize the investors' economic benefits.

Drastic changes have been occurring in China during the past few decades. Agricultural economic organizations are one domain in which various innovations have occurred in both the types and governance of organizations such as agricultural leading companies, farmer cooperatives, and family farms.

The household responsibility system (Lin, 1987), which was formally adopted in the early 1980s following China's 'Open Door' (internationalization) policy, represented the important transition from collective to private ownership of products. Farmers gained a surplus by selling products, but they were exposed to low technology levels and market risks. In the following years, agricultural associations sprouted all over China, mainly serving farmers with technology instruction. Still, small farmers are incapable of negotiating favorably with other market participants due to the small scale of production and the scarcity of market information. Farmer specialized cooperatives (hereafter farmer cooperatives), therefore, were initiated in China in the late 1980s and were characterized by a market and economic orientation. The cooperatives gained momentum after 2000 due to the enactment of the National Cooperative Law<sup>2</sup> in China in 2007. The number, registered capital, total membership size, and average membership size of cooperatives in China for the years 2007-2017 are presented in Table 1. The number of cooperatives increased from 26,000 in 2007 to 1.93 million by the end of July 2017 (State Administration of Industry and Commerce). More than 100 million farmers were members of farmer cooperatives in 2017, accounting for 46.8% of the farmer population. Government also increases funding to the cooperative year on year (Supplementary Table A1).

However, debates about the real or false nature of farmer cooperatives in China have been ongoing since their emergence. One of the main sources of debates is the difference between the core and common members (Liang and Hendrikse, 2013). Decision-making and income rights are allocated mostly to one or a few core members, while the common members specialize in production. The second source of debates lies in the observation that a cooperative can be controlled by a downstream corporation, i.e. the so-called large company-led cooperative, in which common members have no power over the cooperative or even

<sup>2</sup> The National Cooperative Law (in Chinese) can be found at: <https://tinyurl.com/y7rcbhbc>.

**Table 1.** The development of farmer cooperatives in China (2007-July 2017).<sup>1</sup>

	No. of Coop (1000)	Registered capital (billion USD)	Total membership size (million)	Average membership size (households per cooperative)
2007	26.0	46.1	0.35	13
2008	110.9	138.4	1.42	13
2009	246.4	384.5	3.92	16
2010	379.1	692.0	7.16	19
2011	521.7	1,107.2	11.96	23
2012	688.9	1,691.6	23.73	34
2013	982.4	2,906.5	29.51	30
2014	1,288.8	4,198.3	92.27	72
2015	1,531.1	4,967.2	100.90	66
2016	1,794.0	/	106.67	59
July, 2017	1,933.0	/	112.43	58

<sup>1</sup> The State Administration of Industry and Commerce.

their production (Huang *et al.*, 2016). Farmers produce according to the requirements of the corporation; otherwise, the farmers would be excluded from the market that is largely controlled by the corporation.

While not all cooperatives in China are under spotlight regarding the one or both debates mentioned above, most of them do. According to a survey of 266 cooperatives in various provinces in China conducted in 2011, there are four types of cooperatives based on the governance type: cooperatives that are initiated and controlled by rural elites, cooperatives led by corporations, cooperatives initiated by common farmers, and cooperatives led by other organizations such as governmental departments (Huang *et al.*, 2016). These types account for 40%, 31%, 17%, and 12% of cooperatives, respectively. Among the types of cooperatives, the legitimacy as a cooperative of the first two tends to be hotly debated. The BZJ vegetable cooperative is the first type of cooperatives, characterized by a chairperson, Mr. Zhang, who has an absolutely dominant position over the members.

### 3. The Beizhijiang cooperative and Pangu corporation

#### 3.1 Fu Chun Jiang village

Fu Chun Jiang, where the cooperative is located, is the largest village in Fuyang district, Hangzhou, which is the capital of Zhejiang province, with 1,352 households and a population of 5,200. It is located 3 km from the centre of Fuyang district and approximately 40 km from downtown Hangzhou. The village has abundant resources, such as good-quality farmland and water<sup>3</sup>, and specializes in vegetable production. The total area of farmland is 1,944 mu (approximately 65 ha), 40% of which is farmed by BZJ cooperative members. There are two vegetable cooperatives in the village: the BZJ vegetable cooperative and the Dongzhou asparagus cooperative. Approximately 90% of the vegetables from the village are produced by BZJ cooperative members. The prices of vegetables from the village are relatively high because of their high quality and the short geographical distance from the large city of Hangzhou. Non-agricultural industries, including plywood production, apartment rentals, and hotel management, are well developed in the village, which generates a relatively high level of income and a demand for vegetables. Agricultural production and the non-agricultural sectors account for approximately 30 and 70% of villagers' incomes, respectively.

#### 3.2 The Beizhijiang cooperative

The BZJ cooperative was established by Mr. Zhang, his father, his younger brother, and five other farmers in 2009. Zhang was optimistic about the prospects for agriculture and expected more preferential policies for agricultural production. *'I intended to create my own business quite a few years before the foundation of the cooperative'*, Zhang said frankly. It is apparent that Zhang initially started the cooperative as an entrepreneurial pursuit rather than to organize or help farmers.

The main initial function of the cooperative was land circulation and reorganization; however, Zhang did not make money from the circulation of lands. The chairperson, Zhang, together with the other founders visited the householders in the village individually to persuade them to rent their farmland to the cooperative. A farmer who rented land to the cooperative was paid a rental fee of approximately 600 USD per ha per year and automatically became a member of the cooperative. The cooperative receives a subsidy of approximately 10% of the rental fees from the government if the total area of land circulated in a year is larger than 100 mu, i.e. 6.67 ha. All the rented land was reorganized uniformly and subcontracted either to farmers from the local villages or professional vegetable growers, and these farmers automatically became cooperative members as well. The purpose of the land circulation and reorganization is to eliminate the negative effects of land fragmentation and to achieve economies of scale. After the first round of land circulation, the cooperative had 120 members.

<sup>3</sup> After manufacturing factories were closed as part of the local policy of water stewardship, the water quality improved significantly. According to a study conducted by Zhejiang University, 56% of the arable lands in Fuyang are rated as national grade 1 or 2, which are considered good quality (Huifang, 2013).



In addition to land circulation and reorganization, the cooperative provides services such as trainings in vegetable production technology and market information. Members produce under the guidance and supervision of the cooperative, which provides such training opportunities to help members standardize and improve the product quality, though farmers have the final decision-making rights over such issues as the varieties and production scale of vegetables.

Vegetables of relatively high quality, accounting for approximately 30-40% of members' total output, are sold to the Pangu corporation. One of the main founders of Pangu is Zhang. The purchase price is flexible and follows the local market price. The other vegetables produced by the cooperative members are mainly sold in a local wholesale market and wet markets.

There were multiple dimensions of support from the government during the development of the cooperative. The government invited experts several times a year to provide members with training sessions on farming technology, such as how to handle plant diseases and insect pests effectively and how to use fertilizer safely. Support in terms of financial subsidies was also essential to help the cooperative construct its infrastructure and various facilities. So far, the cooperative has received a total of around 230,679.2 USD from the government since its foundation in 2009.<sup>4</sup> The BZJ cooperative was selected as a city-level demonstration cooperative in 2014 and a provincial-level demonstration cooperative in 2015. Being identified as a demonstration cooperative can be a necessity or an added advantage when applying for various government grants.

### 3.3 The Pangu corporation

The Pangu corporation was established in 2011, with a registered capital of around 153,846.2 USD, by Zhang and his family (his father and a younger brother), who are also the largest shareholders of the BZJ cooperative. Specifically, Zhang, who is president of the corporation, holds 55% of the shares, while his father and brother hold 25 and 20%, respectively.

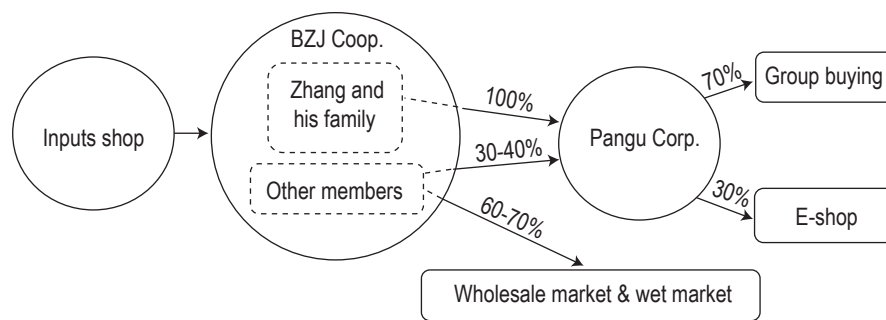
The main business of the Pangu corporation is vegetable purchasing and marketing, i.e. distribution. The sale revenues of the Pangu corporation in 2014, 2015, and 2016 were 1.25 million USD, 1.66 million USD, and 1.18 million USD, respectively, with a rough profit margin of 5%. The corporation purchases vegetables from the BZJ cooperative members and sells to downstream parties, such as the canteens of schools and companies, or delivers vegetables directly to consumers via an e-shop. Zhang's wife is in charge of the operation of the e-shop, which started two years ago and currently accounts for around 30% of the turnover. Some photos of BZJ cooperative and Pangu company can be found in the supplementary Figures A1- A3.

### 3.4 Supply chain relationships between the Beizhijiang cooperative and its upstream and downstream partners

The BZJ corporation helped member farmers establish links with a shop selling production inputs, e.g. fertilizer and pesticide, and came to an agreement on relatively low prices for these inputs. The farmers therefore purchase inputs from the shop at preferential prices. In September 2017, the shop rented a room from the corporation, at the corporation's invitation, so that farmers could buy inputs at the gate.

The supply chain relationship between the BZJ cooperative, the Pangu corporation, and their upstream and downstream partners is displayed in Figure 1. The Pangu corporation purchases vegetables from cooperative members; thus, the BZJ cooperative is an upstream supplier of the Pangu corporation. Zhang and his family sell their products via the Pangu corporation, while approximately 30-40% of other members' products are sold to the Pangu corporation. The corporation does not exert close supervision over members' production, but it takes only qualified products at prices based on demand. Any products that do not meet the quality standards will be rejected. This policy can transmit the pressure of product quality enhancement to members.

<sup>4</sup> We converted the unit all the financial figures through the paper from RMB to USD by the rate '1 USD=6.5 RMB'.



**Figure 1.** Business relationship between the BZJ cooperative and other supply chain.

In addition, the single source of fertilizer and pesticides, as well as the guidance and training sessions regarding the use of inputs, plays an important role in controlling the quality of the products supplied by cooperative members.

## 4. Governance structure of the Beizhijiang cooperative

### 4.1 Capital share distribution of the Beizhijiang cooperative

The evolution of the share distribution of the BZJ cooperative is displayed in Table 2. Initially, Zhang held 20% of the shares, while his brother and father each held 18%. The Fuyang Supply and Marketing Cooperative (hereafter FSM Cooperative), which was established as a government agency responsible for purchasing and selling agricultural products under the planned economy (between 1949 and 1980), held 5% of the capital shares of the cooperative. The FSM Cooperative invested to support the BZJ cooperative, fulfilling its role as a government agency and receiving a fixed bonus from the cooperative at the end of each year, which therefore is an income source.

After the establishment of the Pangu corporation in 2011, the allocation of the shares of the BZJ cooperative changed. The shares held by Zhang, Zhang's father, and Zhang's brother remained the same, while 18.5% of the shares were transferred to the Pangu corporation from the four of the five founding members of the BZJ cooperative. The main reason that the four members sold some of their shares was that they were not willing to invest in farmland circulation since no immediate profit could be gained from renting and subcontracting at that time. The Pangu corporation, therefore, took the opportunity to acquire the shares of those members and began to contribute by investing in land circulation.

To better control the BZJ cooperative, Zhang persuaded other members to transfer 15% of the total shares owned by them to the FSM Cooperative in 2013. Since then, the shares of the FSM cooperative have been increased to 20% and other members' shares (excluding those of Zhang and his family) have been reduced to 5.5%. This structure of the shares remained the same through 2017.

**Table 2.** Allocation of capital shares of the Beizhijiang cooperative (unit: %).

	2009	2011	2013
Zhang	20	20	20
Zhang's brother	18	18	18
Zhang's father	18	18	18
Pangu Corp	—	18.5	18.5
FSM Coop	5	5	20
Others	39	20.5	5.5

The capital share allocation of the BZJ cooperative is delineated in Figure 2. Since Zhang and his family hold all the shares of the corporation, they therefore, either personally or in the name of the corporation, hold approximately 75% of the shares of this cooperative.

#### 4.2 Decision-making rights

The FSM cooperative is an external investor and does not participate in the decision-making of the BZJ cooperative. Although common members theoretically have some rights in decision-making, the BZJ cooperative rarely holds general meetings except for technology training sessions. Indeed, Zhang and his family have absolute power over important affairs. As Zhang said, 'If a key decision needs to be made, such as the construction of a farm gate market, I discuss it with my family, including my father and my brother'.

Although common members have very little decision-making power over the development of the BZJ cooperative, they make decisions regarding their own production plans, such as product varieties and areas.

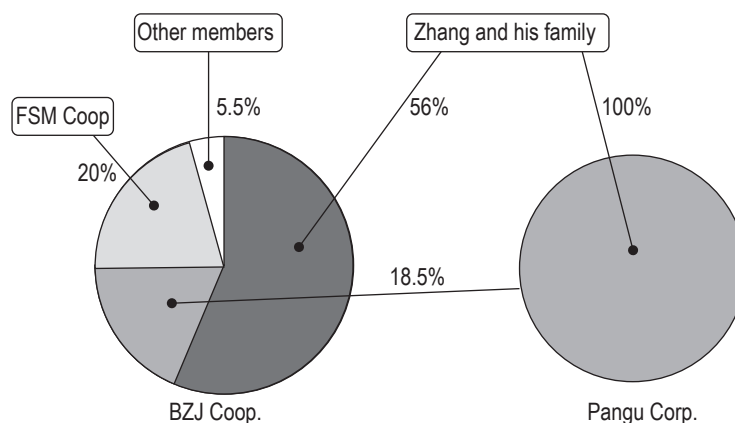
#### 4.3 Income rights

Members of the BZJ cooperative receive payment on delivery from the corporation based on the quantity and quality of the products. The prices are flexible and based on the market price rather than on written contracts. The transaction costs between farmers and the corporation are relatively low.

Profit distribution at the end of the year is based mainly on capital shares. The BZJ cooperative does not distribute profits among farmer members at the end of the year. However, Zhang organizes some tours for the farmer members who deliver products to the corporation. After the payment to the FSM cooperative and the expenses for the tours for farmer members, the remaining profits are distributed among Zhang, his father, and his brother based on the capital shares they hold. The FSM cooperative, as an external investor, receives the bonus based on a fixed rate, which is usually the loan interest rate for that year.

#### 4.4 The Beizhijiang cooperative compared to the International Cooperative Alliance Principles

According to the latest principles for cooperatives published by the International Cooperative Alliance, a cooperative must have (1) voluntary and open membership; (2) democratic member control; (3) member economic participation; (4) autonomy and independence; (5) education, training and information; (6) cooperation among cooperatives; and (7) concern for the community. Detailed explanations of these principles can be found in the Supplementary Materials – International Cooperative Alliance Principles.



**Figure 2.** Distribution of the capital shares of the BZJ cooperative and Pangu corporation.



Regarding voluntary and open membership, the BZJ cooperative adopts a controlled membership policy. All the farmers involved in the circulation of farmland, including local farmers who can lease land and outside professional farmers who rent land from the cooperative, became members. The membership is represented through transaction relationships but not necessarily economic contributions.

Disregarding the principle of democratic control, common members rarely have a say in decision-making, and the cooperative never holds general membership meetings to conduct voting. Members may make complaints or offer advice, but the final decision-making rights lie with Zhang and his family.

Regarding economic participation, common members rarely make any economic contribution to the cooperative or receive profits based on transaction. Initially, nearly 40% of the financial capital was contributed by the other members than Zhang and his family. However, Zhang gradually limited other members' capital shares to an extremely low level, i.e. 5.5%; meanwhile, he transferred the shares to the FSM cooperative and the Pangu corporation, which is controlled by Zhang and his family. Correspondingly, profit distribution at the end of the year is based mainly on capital shares rather than transaction, which detains the distribution of profits to common members.

Regarding autonomy and independence, the BZJ cooperative has weak autonomy and independence. It is similar to an agricultural service and purchasing department, managing the upstream supply chain of the Pangu corporation. The BZJ cooperative currently has few functions except to provide training for farmer members.

Regarding education, training and information, the BZJ cooperative provides farmers with various education and training opportunities through which market and technology information is shared.

Regarding cooperation among cooperatives, Zhang initiated Hangzhou Hanhe cooperative union at a city level, whose members are local cooperatives in various sectors. Cooperative members in the union share technology and market information, and have mutual financing cooperation. In addition, the BZJ cooperative is a member of Zhejiang provincial cooperative union, which is mainly operated by Zhejiang Supply and Marketing Cooperative and provides member cooperatives with production, marketing, and credit information services.

Regarding concern for the community, the development of the cooperative generates inclusive benefits for all the members of the community, e.g. improvements of infrastructure and high-quality vegetables. In addition, the BZJ cooperative broadly circulates all the land in the village, which contributes to the rural development of the entire village.

Based on the above description regarding the practices of the BZJ cooperative in relation to the cooperative principles, it is apparent that the cooperative adopts the three additional ICA principles about what cooperatives should do, i.e. the provision of education, training and information, cooperation among cooperatives, and benefits for the community, yet hardly adopt the four core ICA principles of democratic control, member economic participation, and autonomy and independence, except for voluntary and open membership.

## **5. Benefits for Zhang and his family as well as the common members**

### *5.1 Benefits for Zhang and his family*

We consider the benefits for Zhang together with his family, including his wife, father, and younger brother. There are both economic and non-economic benefits generated for Zhang and his family.

The economic benefits for Zhang and his family include the mark-up between the renting-in and -out of lands, profit from product marketing, and subsidies from the government. First, Zhang rented lands from villagers

and then rented them to other large farmers. In the first few years, he rented lands from villagers and leased them to members at the same price. Now, there is a small mark-up between the renting-in and -out prices.

Second, the profit margin of vegetable purchasing and marketing, which accounts for 5% of the sales revenue, is the main source of economic benefits for Zhang and his family. The average annual net profit of the Pangu corporation has been approximately 60,000-75,000 USD for the past three years. After marketing costs, daily expenses and the payment to the FSM cooperative, the net profit is distributed between Zhang and his family, and the details of that distribution are not available.

Third, a large amount of funding has been received from the government, i.e. 461,538.5 USD, 230,679.2 USD, and 12,307.7 USD, respectively, in the names of the Pangu corporation, the BZJ cooperative, and the family farm. Most of the funding was used to construct offices, storage facilities, and infrastructure; to pay the labor costs of employees; and to cover expenses for training sessions, such as expert fees. After these expenses, the remaining funds from the subsidies are shared between Zhang and his family members.

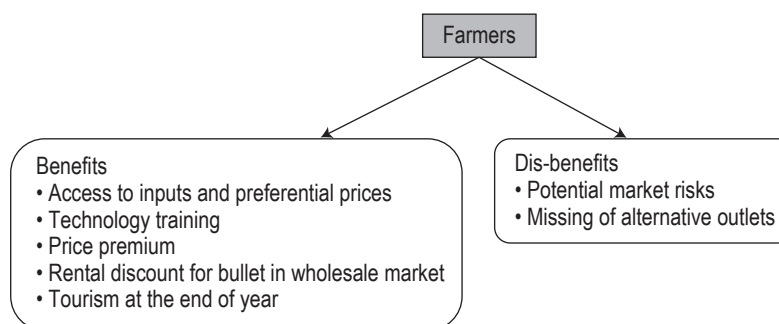
There are also non-economic benefits for Zhang and his family, including technology training from the government, the stable provision of vegetables from farmers, and economy of scale in marketing. Every year, several technology and marketing training sessions for farmers are provided by the government and organized by the cooperative or the corporation. Zhang and his family, who are also vegetables growers, benefit from the training.

The Pangu corporation purchases vegetables from members of the cooperative without formal contracts. The quantity of the purchase depends on the demand. In bad years, Pangu reduces the amount it purchases from members. Thus, the corporation does not take many market risks, and most risks fall on the farmer members.

In addition, the purchasing of vegetables from farmers and their delivery to downstream buyers generates economies of scale in the transactions, which reduces the transaction costs. Scaling up transactions is preferred to scaling up production due to the high cost of the supervision of agricultural production. Zhang therefore rented lands from villagers and subcontracted to other farmers to limit the scale of his own farming, meanwhile enlarging the scale of the transactions.

### 5.2 Benefits and disbenefits for other farmer members

Both benefits and disbenefits for farmers are observed in the business model (Figure 3). The benefits include convenient access to input stores and preferential prices, technology training, product delivery with the corporation, the use of a wholesale market booth with preferential rental, and travel at the end of the year, while the disbenefits lie in the latent market risk and the loss of other potential outlets.



**Figure 3.** Benefits and disbenefits for common farmer members.

Farmers buy inputs from a shop located at farm gate and at preferential, which therefore helps farmers save both transaction costs and production costs. In addition, farmers have convenient and prompt access to instructions from the input shop regarding the use of inputs such as fertilizer and pesticide.

Farmers can join any technological training sessions at no cost to themselves. The content of the training sessions includes new and extended product varieties, technology applications, food safety issues, and market information. There are two ways to organize these trainings. First, the local government invites experts and entrusts the cooperative to organize the farmers. Second, the cooperative itself invites experts from universities or research institutes to deliver lectures to the farmer members.

Cooperative members and the Pangu corporation have a long-term but flexible implicit contract based on trust. There are no formal written contracts. The relationship is more like relational governance. Members deliver high-quality products to the Pangu corporation and receive price premiums, which are higher than the market price.

The BZJ cooperative, representing all the members, negotiated with a local wholesale market in Hangzhou to obtain a booth with a good position at a relatively low rental price. Each member can use the booth to sell vegetables, and the rental fee is shared based on use.

The BZJ cooperative organizes tours at the end of each year as a bonus for members who deliver products to the corporation. Members with a relatively small transaction volume receive short-distance tours, for example, within the local city, while members with a large transaction volume receive longer-distance tours. These tours can be regarded as the benefit returned to members based on their transactions.

However, farmers might face latent market risks. There is no formal transaction contract regarding either the quantity or the price between the farmers and the Pangu corporation. The loss can be transferred to the farmers if the corporation suffers difficulties regarding sales. That is, if its prices fall or a demand for vegetables from downstream buyers is depressed, the corporation would decrease the quantity of its purchasing from farmers or reduce the prices it pays to the farmers. In addition, farmers tend to rely on the current business relationship and lack incentive to seek other potential outlets that might generate even higher benefits.

## 6. Looking forward

Zhang is hopeful in planning the future of his business. He is attempting to expand the scale of production and rent more lands for the construction of the farm gate marketplace and farming park. Zhang's ideal pattern of business is multiple-function agriculture that incorporates farming, marketing, and tourism. Zhang is optimistic about the prospects for agriculture and expects more preferential policies to support his future plans. Despite this optimism, he is more concerned than ever about agricultural policy, particularly regarding cooperatives.

## Supplementary material

Supplementary material can be found online at <https://doi.org/10.22434/IFAMR2018.0006>.

**Table A1.** Governmental funding for farmer cooperatives in China (2007-2015).

**Figure A1.** Photo name plates Beizhijiang cooperative and Pangu corporation.

**Figure A2.** Photos vegetable farms Beizhijiang cooperative.

**Figure A3.** Photos vegetable packaging Pangu corporation.

**Background A1.** International Cooperative Alliance Principles.

**Teaching note.**

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