Final Report

Linking Smallholders with Rapidly Transforming Markets: Modernizing Smallholder Agriculture through Value Chain Development in China

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Submitted

by

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Contents

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Acronyms and Abbreviations

ADB	Asian Development Bank
AFPA	Agricultural Fair Practices Act
AFVC	Agri-food value chain
AQSIQ	Administration of Quality Supervision, Inspection and Quarantine
CASM	Cooperative for Agricultural Supply and Marketing
CFU	Colony Forming Unit
COFCO	China Oil and Food Corporation
CRP	CGIAR Challenge Research Program
CIDA	Canadian International Development Agency
DC	Distribution Center
DFID	Department for International Development of the UK
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
FPCL	China Farmers Professional Cooperative Law
FTS	Farmer-to-Supermarket
GAIC	General Administration of Industry and Commerce
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GM	Genetically Modified
GTZ	German Organization for Technical Cooperation
HACCP	Hazard analysis and critical control points
IFAD	International Fund for Agricultural Development
ILO	International Labor Organization
IOF	investor-owned firms
ISO	International Organization for Standardization
MIIT	Ministry of Industry and Information Technology
MNC	Multinational Corporation
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOFCOM	Ministry of Commerce
MOH	Ministry of Health
MOST	Ministry of Science and Technology
NEPAD	New Partnership for Africa's Development
NDRC	National Development and Reform Commission
NGO	non-governmental organization
R&D	research and development
SDC	Swiss Agency for Development and Cooperation
SFDA	State Food and Drug Administration
SMAE	Small-medium agricultural enterprise
TFP	Total factor productivity
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
VAT	Value-added tax
WTO	World Trade Organization

1. Background

1.1 Introduction

Along with its rapid economic growth, increasing urbanization, and accelerating integration into the world market, China has experienced rapid transformation of its food value chains. There has been a surge in the number of its supermarkets and hypermarkets. The advent and rapid expansion of the modern self-service store has transformed the organization of and relations between the institutional actors of China's agri-food systems. At the same time, increasing migration and off-farm employment coupled with increasing input costs, for inputs such as labor and energy, have pushed farmers to expand in order to achieve scale economies. The emergence of agri-food value chains is considered to be a potential market integration opportunity for promoting smallholder agricultural and rural development in China.

However, many questions need to be addressed in order to maximize the benefits of these developments, including: What are the key drivers of this rapid transformation? Are there any risks for small producers and the rural poor? What barriers do smallholders face in accessing such emerging markets? What is the nature of the emerging opportunities for smallholders? How can smallholders adapt to overcome the challenges and capitalize on the opportunities? In addition, what are the existing or emerging inclusive value chains for rural and agricultural producers in China that could benefit the small farmer and the rural poor if they were to get engaged in them? How can development projects funded by governments and international financial institutions ensure that the development of agri-food value chains benefit small producers and the rural poor?

1.2 Objectives

The larger objective of this report is to shed light on the context and evolution of agri-food value chains in China's rural sphere from the perspective of small farmers and the rural poor. Relevant strategies and policy recommendations are made for development projects supported by governments and donors.

Four specific objectives are:

(i) To examine the changes taking place in the functioning and organization of China's food systems and to identify challenges for the inclusion of smallholders.

(ii) To identify good practices for linking smallholders with markets in China.

(iii) To identify how the government and international organizations can facilitate the development of more efficient agri-food value chains in China, with due attention paid to smallholders.

(iv) To identify lessons from experience to date in China for development project design and management.

1.3 Scope and Method

This study is a qualitative appraisal comprised of a combination of desk study and short field visits. The desktop review involved scanning the literature on linking small farmers with markets, agri-food value chain development, and the changing agri-food systems in China. To familiarize the team with the features of current and future IFAD-supported projects in China, two meetings with representatives of the IFAD China Office were arranged in October 2012; also a three-day field trip to Xinyang, Henan, was made November 24-28, 2012. However, the review was not limited to IFAD funded projects. The research draws on the experiences of both public and private sector players, personnel and institutions, and relevant scientific and industrial experience. Participants were drawn from different levels of the value chain, and included producers, processors, traders, wholesalers, and retailers.

The information for the field study was gathered in the following ways:

1) Interviews were conducted with: a) government representatives and advisers involved in issues related to food and agricultural chain development; and b) industry representatives, such as producer groups, wholesalers, processors, and traders/exporters.

2) Interviews were conducted with the purchase managers of selected supermarkets and other new markets, as well as with city officials knowledgeable about the regulation of and policies related to the purchase, sale, and distribution of agri-food products.

3) Interviews were conducted with producers, wholesalers, processors, and traders, covering production, preliminary processing, transport, storage, final processing, and export.

The information generated from the desk review and field research was used to identify various practices of linking smallholders with markets in China.

2. Transformation of China's Agri-food System

2.1 The Rapid Spread of Supermarkets and Other Modern Traders

China's Agri-food retailing is undergoing a major transformation, in which new benchmarks have been created and reinforced by the rapidly heightening expectations of Chinese consumers. The most notable change is the rapid growth of modern self-service stores in China that sell food, including hypermarkets, supermarkets, discount stores, and convenience stores.

1) The Overall Growth of Modern Self-Service Stores Continues. Early supermarkets in China were few, small, local, and traditional. The expansion of supermarkets in China only began in the 1990's and there has been a rapid

surge starting in the mid-1990s but really taking off in the 2000s (see Reardon et al. 2012, Hu et al. 2004), making China the most dynamic modern retail market (Nielsen 2010a).

2) The growth of hypermarkets and convenience stores is particularly fast. Various modern retail outlets, including conventional supermarkets, hypermarkets, discount stores, convenience stores and department stores, have developed. Though conventional supermarkets are still very important in China, the trend has been the increased penetration of large format Hypermarkets and small format Convenience Stores (see Nielsen 2010b).

3) Consumers now increasingly shop for fresh food in modern retail stores instead of in traditional markets. Not long ago, in 2003, it was found that consumers preferred to shop for fresh food in traditional markets despite the rapid chain store growth (Chen 2004). Five years later, the trend had changed dramatically (see Chinese Statistics on Chain Operation 2009).

4) Shopping in supermarkets has begun to spread from the richer and upper middle class to the middle and poor consumer segments and from large to medium cities/towns. In general, there has been a trend away from the paradigm of supermarkets' occupying only a small niche in capital cities and serving only the rich and upper middle class to one in which they spread well beyond in order to penetrate into the mass food markets. They have also spread from big cities to intermediate towns and then to small towns.

5) There has been increased penetration of foreign food retailers. The participation of the leading US and European agri-food multinational corporations (MNCs) in Chinese markets, and the incorporation of Asia into their global operations have both increased. The main MNCs are Carrefour, Walmart, Metro, Jusco, and Tesco. Many form joint ventures and marketing alliances with domestic supermarket chains or other MNCs. These MNCs are among the top chains in China.

6) There has been increased consolidation in the retail sector. The consolidation takes place mainly via foreign acquisition of local chains and secondarily by larger domestic chains absorbing smaller chains and independent stores. Supermarkets that lack the scale of the bigger operators have been forced to reposition themselves to focus on niche markets. After almost 10 years, the share of the top 5 chains has reached 9% in China in 2009 (Nielsen 2010a).

7) The variety of foods available in markets has increased and demand is growing for products that address specific health and diet requirements. Many innovative retailer/supplier partnerships have collaboratively shaped the new model. The new model has the opportunity to deliver tremendous new value to produce categories. As concern about food safety has grown, consumers have increasingly been looking to supermarkets to ensure the safety of food products.

2.2 Increasingly Rationalization of Processing Industries

The transformation of the retail sectors appears to have had little impact on chicken processors in China as they were already quite consolidated and experienced in modern markets and so they have had little difficulty adapting to supplying supermarket chains. By contrast, it appears that a number of small and medium vegetable and meat packers and processors are relatively unprepared for conditions and requirements in the market that accompany the rise of modern retail. To survive, processors have had to invest in computerized systems to better track production and control costs, and staff have had to be trained in how to handle orders from modern retailers.

It appears that these retail-side pressures have led to the exit of a number of processors, especially in the meat and vegetable industry (where half the remaining firms are expected to merge or go bankrupt). Shakeout of local processors is continuing, however; a select number of resilient firms, including some amalgamated ones, have now adapted and are taking a growing supermarket share.

2.3 The Changing Role of Wholesalers and Traders

The produce distribution system continues to be characterized by strong participation from urban-based intermediaries. Such dependence is largely because of the absence of a well-developed marketing infrastructure in many vegetable production areas in China. This is particularly true in those areas that have not been involved in export-oriented commerce.

However, supermarkets have dual objectives (to increase food safety and quality and to reduce costs and increase volumes procured) which are hard to meet using only the traditional wholesale sector. A few notable drawbacks of traditional wholesalers are: 1) spotty and inadequate use of refrigerated storage such as temperature-controlled chambers. 2) Packaging materials that undermine the preservation of product quality. 3) Heavy reliance on manual labor, prolonging merchandise exposure to ambient temperatures. 4) Poor wholesale handling contributing to significant losses especially for the most perishable items.

It was observed that vegetable wholesalers are facing a ‘bypassing’ pressure from modern retail and service outlets. They no longer enjoy the excessive profits they used to get. But at several of the vegetable wholesale markets visited, most administrators and merchants appeared unconcerned, at least in the short run, regarding the threat posed by the proliferation of chain stores. And, in fact, most believe that over the next 20-30 years, wholesalers will still play a key role in vegetable distribution in China.

Evidence of disintermediation, in which the traditional role of the village trader is reduced, was found upstream as wholesale markets sourced paddy directly from farmers, and increased direct sourcing by the mills from farmers was reported in Reardon et al (2012) and source tomatoes directly from farmers, bypassing the village trader system (Huang and Reardon 2008). Disintermediation was evident downstream in China, with mills selling directly

to wholesale markets and retailers in big cities. In China, it was found that a third of wholesalers were agents representing single large mills.

2.4 New Business Practices for Sourcing Products

The modern retail chains' procurement systems are very different from the traditional stores'. These differences are highlighted below. *First, increasing use of supply contracts.* Supplier contracts allow supermarkets to control safety and quality, ensure desired supply volumes, and reduce price uncertainty. There has been increased co-ordination between supermarket chains and suppliers through more demanding contracts. *Second, numerous and costly criteria for supplier accreditation.* Increased demand for technical certification, such as HACCP, ISO 9000, or HACCP-based farm quality assurance. There is a certain required access to adequate facilities for sorting, grading, packing, storage, and transport. *Third, towards regional and global sourcing networks.* As the number of stores grows, there has been an increasing consolidation of the procurement systems by store, by distribution center (DC), by zone, and by region. The bargaining power of supermarket buyers comes from their access to regional and global networks of suppliers and their huge volumes. Supermarket companies prefer to deal with large traders with regional and global supply networks. The retailers rely on them to produce large volumes and various varieties at required times. Movement by retailers from less local sourcing towards more China-wide, as well as regional and global sourcing is happening very fast even in the fresh produce segment. *Fourth, tough contract negotiations and enforcement.* There has been a significant shift in the weight of agri-food industry power away from the agri-food processors and towards the food retailers. Chain stores tend to reject deliveries of imperfect merchandise far most frequently than do produce wholesalers and brokers. Several retailers such as Tesco and Carrefour in China adopted a prefered supplier scheme, Under which the supplier will be delisted if it cannot meet the volume and quality requirements.

2.5 Emerging Intermediaries

While there have been clear efficiency gains in some industries due to increased vertical coordination, the possibility remains that large contractors will use their power to depress the prices paid for the inputs, and to make other contract conditions disadvantageous for producers. First, this has motivated producers to form associations to bargain collectively with the processor, in a manner similar to labor unions. Second, commodity groups can play a key role in the development of fair contract terms. It is not clear to what extent this is occurring yet in China. Commodity groups are well suited to bring together large and small producers, processors, integrators, attorneys, and others to jointly address the development of contracts that will serve the needs of all parties. Third, the involvement of producer organizations is also likely to generate greater "buy-in" on the part of producers faced with the option of joining a closely coordinated value chain by producing under contract for specific processors. This reduces the processors' transaction costs in locating and negotiating with suitable suppliers.

The China Farmers Professional Cooperative Law (FPCL) was passed in November of 2006 and was enacted in July of 2007. With the passage of this legislation came the rapid development of farmer cooperatives in China. In 2012, it was reported that 17 % of farmers were with cooperatives (MoA 2012), which suggests that a cooperative movement is rapidly taking place in China today.

2.6 Vision for China's Agriculture

China has more than 250 billion smallholders, which produce the majority of its national food, and manage 95% of its cultivated land. Yet, despite their apparent importance, smallholder farmers are often neglected in agricultural policies. Policymakers tend to think that large farms are more modern and efficient, while large agricultural companies also benefit from greater lobbying power. At the same time, and as China enters a new economic development stage coupled with increasing urbanization, smallholders face many challenges. Despite this, smallholders continue to dominate the rural landscape in China.

As of late, however, a new policy direction appears to be in the making. The government of China has recently released its 2013 Number One Policy Document (Xinhua News 2013). The document recognizes the need for a new approach to China's agricultural development in the face of industrialization and urbanization. One of the key issues on which the 2013 Number One Policy Document focuses is the organization and structure of the farming sector. It calls for innovative organizational forms for farming and encourages the co-existence of a variety of organizational forms, including specialized farm households, family farms, cooperatives, and corporate farming. The new policy initiative also calls for the introduction of a code of conduct for responsible investment in rural land, particularly in the leasing and acquisition of farm land. The document calls for the completion of the farmland registration system within the next five years. Also, strict conditions to ensure that small farmers benefit will be established for land acquisition deals. Meanwhile, the Document calls for various policy initiatives to help modernize China's agriculture through various means, including increasing agricultural subsidy and support, promoting the agricultural service sector, enlarging the scale of the farming operational unit, and improving marketing efficiency.

China's agricultural production has so far come almost entirely from small-scale operations. Between 1980 and 2002 the average size of land of farming households actually fell from 0.71 to 0.55 ha. Average farm size has increased slightly since then to 0.6 ha in 2008, through the renting in of land (Christiaensen 2012). In livestock operations there has also been some emerging consolidation: there has been an increase in the size of hog farms with the rapid decline of backyard producers (Chen and Wang 2013). Forms other than small farms are emerging, but still have a minor share: (1) the share of specialized household production has risen rapidly; (2) large-scale integrated industrial units have also experienced more moderate growth. Smallholder farming on small and dispersed parcels remains the defining

form, as noted above. An emerging issue is how to modernize traditional agriculture. The vision of commercial smallholder-based farming and food self-sufficiency ambitions is in line at present with China's initial conditions, which include small and fragmented farm structures as well as the political imperative of food sovereignty. Commercial smallholder farming and part-time farming during the transition is economically viable, socially desirable, and politically sensible (Chen 2012).

2 Implications for Smallholder Farmers

The retail revolution and transformation of the processing sector observed in China have had a significant impact on the country's food distribution system. These have created a number of opportunities as well as barriers for smallholders.

4.1 New Markets for Farmers

The development of modern retail and service outlets has created new market opportunities for farmers. Poor households can be incorporated into, and often benefit from, formal markets in three primary ways: (1) through product markets as producers, (2) through labor markets as wage laborers, and (3) through service markets as providers of services to the chain.

Modern markets can reach small, poor farmers in two ways. The first mechanism is active, whereby a farmer or farmer organization can seek to supply products or labor in a new value chain. The second is involuntary, occurring when an existing market that a farmer has been supplying – usually a domestic market – starts to modernize and restructure, and adopt new conditions of market participation. An empirical analysis of 10 domestic chains in eight countries gives the following insights (Huang and Reardon 2008): overall, the evidence of excluding small farms measured by farm size (e.g. land area for crops and herd size for livestock products) from market restructuring was mixed. Four cases out of ten showed evidence of small farms excluded from emerging modern markets. In some cases, the companies reach out to smallholders. For example, Carrefour has recently made such public commitments. These efforts at inclusion might reach significant numbers of small farmers.

Both the literature and project experience indicate that poor households' access to assets, and their ability to accumulate and use those assets effectively, are critical to their participation in value chains and their ability to benefit from participation (McKay 2010). This has two major implications when it comes to creating inclusive markets. First, pre-existing assets improve the likelihood that producers will benefit from a trading opportunity, raising the importance of suitably matching capable farmers with market opportunity. Second, understanding the gap between available assets and those necessary to benefit successfully in the long-term in a particular market is critical to designing a strategy to expand participation to those with fewer initial assets.

Market linkage projects often seek to build or strengthen weak assets. Assets may be substitutable and it may be possible to design interventions to compensate for weak or non- existent assets. Human capital in the form of skills and education was a key characteristic present in comparative studies on participants versus non-participants in formalized value chains (Wang 2011).

4.2 Barriers to Access

There are a number of barriers to direct linkages between small farmers and modern retailers:

Inadequate market incentives related to quantity, food safety, quality, timing, and other characteristics wanted by supermarket chains. The increased specificity in agricultural product requirements combined with the potential for producing specific attributes in those products has started to transform part of the agricultural markets to a differentiated product market. Open spot markets often cannot fully convey information about these specific attributes. Without the ability to fully capture returns to the costly control of production hazards, producers lack the incentive to implement controls for food safety and other quality attributes. Interviews showed that the farmers thought the requirements were too stringent and the prices were not high enough to cover the cost and trouble they go through to meet the requirements. The compliance cost is too high for small producers to bear. Those smallholders without access to development aid and technical assistance tend to be cut off from direct supply to supermarket chains. Even those who meet entry barriers do not necessarily gain in terms of higher value added. It is clear that the suppliers who successfully supply to supermarket chains typically secure some initial funding from either the buyers or governments.

Lack of sorting and assembly functions for fresh vegetables in production areas in China. Most of the packing and distribution centers in rural areas are controlled by large producers. The implication is that even if supermarket chains eventually attained the economy of scale needed to justify building independent distribution centers in each region where they cooperated and had the capacity to receive the most produce directly from growers, an immediate transition to greater direct deliveries would not necessarily follow.

Absence of commonly-agreed upon and enforceable grades and standards for fresh produce, coupled with inadequate quality control in the produce supply chain. Most standards in China, often incomplete, are voluntary in nature or not enforceable. This impedes the adoption of modern trading methods for the traders involved.

Grower misconceptions about chain stores. Farmers think that it is more difficult to work with chain stores than with other produce receivers. There exists producer resistance to direct shipments. Most small producers prefer

to market their products through an intermediary rather than directly to retail produce receivers.

Vertical integration of production and wholesale functions. Most of the largest produce wholesalers/transporters/distributors are also involved directly in agricultural production and are responsible for selling and distributing their own production as well as the production of others, usually small growers. In China, the relationship between farmers and transporters is very close, leading farmers to feel "trapped".

Infrastructural obstacles and challenges. Preserving product quality from origin to destination cannot be ensured due to inadequate access to refrigerated transportation, poor roads, and the predominant use of thinly insulated packaging materials. It becomes preferable to conduct product sorting and classification functions further along in the distribution channels. To overcome these obstacle, large initial investment is needed, obtaining access to which is difficult for small players.

4.3 Smallholders at a Crossroads

With the development of modern trade, there has been gravitation toward large organized producers. At the same time, modern traders' specifications are said to be too demanding to be profitable for small farmers. Because many vegetable producers are not accustomed to delivering products in a format that can be easily received by modern buyers and may be reluctant or unable to conduct long-distance sales transactions without advance payment, it comes as little surprise that chain stores have frequently established direct shipment contracts with a relatively small group of larger producers or well-organized associations.

Selecting preferred suppliers entails disqualifying others. Often smallholders become unable to supply high-end supermarkets or service outlets. It tends to be large organized farmers who can meet the quality and logistical requirements related to volume and consistency, demanded by supermarkets. Some evidence suggests that many small farmers are having a hard time meeting the demands of the supermarkets while generating higher incomes for their members, compared with their sales to traditional markets. There is growing anecdotal evidence of success based on case studies but no large scale study exists to document how the supply chain activities impact the incomes of farmers. Some of notable effects are:

- Commercial farmers struggled to meet the new requirements passed through by traders and processors.
- The development of value chains is seen as an opportunity for small farms and firms because of their higher value-added and income-generation potential.
- As commercial farmers adapted to supermarket requirements, there was a decline in sales to domestic retail channels.
- There is little chance for individual small farmers to sell directly to supermarkets.

- Some farmer associations and cooperatives that have invested in advanced grading and sorting equipment have been accredited.
- Tesco, for example, supports this channel to create a socially responsible image.
- The lower tail of the distribution of small dairy producers forced out as dairy became more competitive
- Poverty impact is not favorable in the short run.
- There is an emergence of farmer/traders with own packing facilities and supermarket contracts.

There are also indirect adverse impacts of the emerging modern trade on small farmers. The emerging modern trade has induced a marked reduction of small retailers, street vendors, and wholesalers to whom small farmers usually sell their products. There are positive effects as well. For example, the Carrefour chain stores have been preparing to allow organized farmers through cooperatives to supply their fresh produce directly to the company's stores. This may help farmers to obtain higher prices by bypassing middlemen, who normally kept prices down as they knew farmers had no alternative buyers.

Emerging modern trade begins to change the way farming is done in China. To keep pace with demand, farms will have to adjust by specializing in a particular commodity, consolidating fragmented land holdings to achieve scale economies, and forging stronger links with processors and retailers. Closer relationships between firms at different stages of production and marketing are emerging as larger commercialized farm operations grow produce and animals under contract for processors, retailers, or exporters.

The impact of modern trade on farming is unlikely to be scale-neutral. As a result, it can have a huge distributional effect on the farming sector. One of the key issues is the access to supply chains. Concern is expressed over issues of market power held by commodity handlers and processors. One concern is that, in the future, some producers may have difficulty gaining entry to tightly coordinated supply chains. Difficulty in gaining entry could be caused by requirements for sophisticated production skills or the need for equipment or capital. The inability of certain producers to gain entry to supply chains for these reasons would be a continuation of the forces that have prompted producers to exit from agriculture historically. Another reason why producers might have difficulty gaining entry is that processors prefer to lower their transaction costs by dealing with only a few producers, who are contracted to provide large volumes of the commodity in question. A third reason that entry might be restricted could be that a dominant processor with market power could create a monopsony and purchase less of the input than would occur in a competitive market.

The supermarket chains locked in struggle with other chains in a highly competitive industry with low margins, seek constantly to lower product and transaction costs and risks. As supermarkets compete with each other and with the informal sector, they will not allow consumer prices to increase in

order to pay for the farm-level investments needed for the success of small farmers.

The emerging value chains are expected to have both positive and negative impacts on various participants in the agri-food systems, particularly on small rural farmers and processors, and therefore open up considerable opportunities as well as challenges for economic development policies and strategies in the poor regions.

Of particular concern is the risk that many smaller scale producers, processors and retailers might have been or eventually will be excluded from the development of the main supply chains. If those who had lost from the change had been confined to the non-participants, the policy implications would be clear - take every step to be an active participant in the supply chain. However, the challenge is much more daunting than this, since the losers include many of those who have participated actively in the development of the supply chain. A particular problem is that the poor and poor regions seem to have experienced more of the downside than the upside of the development of the supply chain over the past ten years.

Small farmers can potentially adapt and should be helped or organize together quickly; otherwise they may be locked into a declining traditional market segment. Small Farmers who cannot attach to the supermarket supply chain may be helped by policies and lending to modernize traditional food retail channels (e.g. promote safety and cleanliness). The current regulations are based mainly on safety issues. They do not take into account social impacts, the number of outlets, and the appropriateness of locations.

How should farmers make decisions about what to do in the face of current trends? Options for farmers who are struggling to survive are: a) to get big; b) to engage with formal cooperative models or look for purchasing and selling alliances or other business models; c) to engage in a value-added option; d) to diversify activities using the farm resources, such as into ag-tourism; e) to participate in off-farm work; f) to start non-farm business; and g) to exit.

The effects of these various options need to be evaluated thoroughly before a sound policy can be laid out.

3 Approaches to Linking Smallholders with Markets in China

5.1 Drivers for Smallholders to Link with Value Chain

The rapid decline in the agricultural and rural labor force, following the aging of the rural population and growth in urban migration, especially among young men, is pushing up rural wages. This challenges the smallholder farm model. Smallholders must expand to generate earnings comparable with off-farm employment as well as to capture the economies of scale from mechanization following the substitution of capital for labor. Poultry chains are largely a result of a response to export market demand on safety and quality, while many vegetable chains are formed to supply niche goods, such as packaged

vegetables with private brands, organic vegetables and other certified vegetables. There are brands such as “Green” or “no pollution’’ vegetables in China. Like elsewhere, agri-food value chain formation in China is driven by the desire to improve competitiveness. In order to survive in this increasingly competitive retailing environment, small farmers must also respond to the following drivers:

- Food safety issues: the development of detailed safety assurance systems from primary production to retail. This type of chain may be small scale or involve an entire sector strategy involving major producer organizations and large-scale food processors and retailers.

- Product quality and other requirements: retailers are demanding increasingly high standards both in the areas of product specifications – size, color, texture, and composition.

- Assurance of supply - the right quantities at the right time.

- Flexibility and ability to respond to changing consumer needs and demographics.

- Product innovation and differentiation: typically involves the development of niche markets and is most appropriate for smaller organizations working to develop specialty markets.

- Lowering systemic cost: the drive to reduce logistics costs which can include a range of transaction, delivery, and warehousing and delivery costs. Typically these chains require a strong operations research focus to identify system bottlenecks and to seek out inefficiencies that need to be improved.

The prevailing forces driving chain development are likely to intensify further as the supermarket chains expand. Long-term competitiveness as a food supplier will depend upon continuous improvement of such factors as market differentiation, quality assurance, and reducing systemic costs - all of which can be addressed within a domain of value chain management. Consequently, value chain formation is likely to occur rapidly in China’s food producing regions.

3.7 Agri-food Value Chain Development

Agri-food value chain development has increasingly been adopted as a new development strategy by many development agencies and developing countries. Over time a value chain approach to development—ranging from inputs supply, extension, market services, financing, production, processing and distribution to marketing, has increasingly been adopted by governments, donors, non-governmental organizations, and development initiatives to promote market-oriented growth, and to reduce rural poverty in developing countries (Fan 2012).

For example, Asian Development Bank (ADB) has recently listed the development of food value chains as a strategy to address the food security challenges in the Asia Pacific (ADB 2011), while NEPAD lists agri-food value chain development as one of its four critical pillars for African agricultural development (NEPAD 2009). Multilateral organizations such as the World Bank, FAO, UNIDO, IFAD, UNCTAD, and ILO and bilateral agencies such as GTZ, USAID, CIDA, SDC and DFID are all committed to pro-poor value chain development (Altenburg 2006). For agriculture-led growth to be effective, it should concentrate on smallholder farmers that are in potentially productive areas and have access to markets. The CGIAR Challenge Research Program 2 (CRP 2) on 'Policies, Institutions and Markets' calls for more research and understanding on linking smallholders with markets, while CRP4 on 'Agriculture and Nutrition' identifies the development of a nutrition sensitive value chain as an approach to address nutritional security in the developing world. In China, a number of national initiatives have recently been introduced to help link farmers with markets (see section 5.4).

5.3 Case Studies and Typology of Market Linkages

There are numerous cases that show the various means through which smallholders link with markets. A detailed description of selected cases is presented in Appendix 1. It is important to note that these cases are not validated and therefore cannot be automatically considered successful cases. Nevertheless, it is clear that there are a wide range of market opportunities available to Chinese farmers. There are clearly extensive list of various types of linkages that have been found in practice. The linkages can be categorized below

- Linkage through leading farmers
- Linkage through local traders
- Linkage through local wholesalers
- Linkage through cooperatives
- Linkage through associations
- Linkage through shareholding
- Linkage through distribution centers
- Linkage through corporate farms
- Linkage through processors
- Linkage through supermarkets
- Linkage through institutions
- Linkage through fast food chains
- Linkage through exporters

The above categories are not always mutually exclusive. Leading farmers can be local traders. Exporters can also be agro-processors. Retailers may buy from farmers through traders. What is characteristic of almost all of the linkages described is that they form clearly identified chains and often involve close relations between the participants. Brief features of selected cases are presented in Appendix A Table 1.

5.4 Public Market Linkage Programs in China

There is also an extensive list of public market linkage programs in China (Appendix A Table 2).

- Starting in 2000, a national policy was introduced to encourage the development of 'village traders' to help farmers link with markets.

- Several initiatives have been founded since the late 1990's to upgrade the wholesale markets across the country in terms of quality inspection consistency and cold storage capacity. Such upgrades are aimed at encouraging wholesale markets to actively link with modern markets, such as supermarkets and fast food chains.

- Agricultural industrialization policy encourages agri-food enterprises to link up with small farmers.

- In 2007, a new law on farmer cooperatives was passed to enhance farmer access to output and input markets.

- Since 2008, China has started to link research with markets through the whole value chain approach in order to modernize its agricultural R&D system. Value-chain driven agricultural innovation platforms cover 50 commodities including crops, livestock, vegetables, fruits, and aquaculture products. A total of 50 value chain-based research consortiums have been built with a total funding of 10 billion RMB (MOA 2008).

- In 2007, the Chinese Ministry of Commerce initiated the "farmer-to-supermarket" (FTS) program to promote direct links between farmers and supermarkets and to improve farmers' ability to access modern markets. The program encourages partnerships between the government, farmers, and businesses. From 2007 to 2012, the number of provinces that participated in the program increased from 7 to 15.

Most of them are supported by the government, while a few are also supported by the donors. The nature of programs focuses from facilitation, to investment in infrastructure, and to direct subsidy. They represent a wide range of private public partnership. The detailed description of the programs is presented in Appendix 2. It is worth noting that none of those programs have been evaluated systematically.

5.5 Determinants of Success for the Market Linkages

The sections below are largely drawn from Chen and Hu (2009) and Shepherd (2007). The critical point for any development projects has to be profitable markets. There is typically a tendency for excessive donor and NGO interest in export and "niche" markets, and for the exclusion of local ones. On the other hand, local interventions may swamp small markets to the detriment

of all farmers. Not only the market but also the marketing chain must be fully understood. There are a number of factors affecting the success of linkages as identified below.

Choosing right farmers. Farmers must have the capacity to exploit market potential in terms of location and infrastructure, social structure and education levels, land area and tenure, agronomic suitability, climate, pests and diseases, assets and access to finance, access to extension, market information, capacity to meet market requirements, and willingness to take risks.

Linking with the private sector is central. Linkages require working with the private sector, not against it. Many NGOs or donor projects lack a commercial orientation. Suspicion of the private sector continues. Organizations cannot work with the private sector if staff is suspicious of private business. Small traders can be an effective linkage. They are also looking to respond to new trends

The capacity of the linking organization. A typical challenge is attracting the right staff. NGOs and others recognize that training and experience exchange is required. Areas for training include contract negotiation, market research, value chain analysis, and business management.

A role for subsidies and direct provision of services. NGOs, donors and others are often very generous with subsidies. Subsidies are generally incompatible with efforts to develop sustainable business ventures. Subsidies can provide unfair advantages to selected farmers or businesses, to the detriment of others. Direct service provision, such as marketing services, can squeeze out existing commercial services. Available resources should be spent on linkage development, training, market assessment but not on farm inputs or marketing for farmers, on equipment for processors.

Developing mutual trust. Trust between parties is essential for sustainable long-term linkages. Many linkage activities break down because of disagreements. Parties are remote from each other and lack "social capital." There is a lack of understanding by farmers on long-term benefits of honoring contracts. There is easy potential for opportunistic behavior.

Farmers as a group. Farmers are often reluctant to work together. Groups are best developed when they already have group experience, e.g. from Savings and Loans Clubs. Homogeneous groups (in terms of assets; skills; sex) seem to work better. Smaller groups (20-25) seem more cohesive, but larger groups have scale economies and are able to recruit necessary management skills. Economic benefits should come from profitable activities, not subsidies, i.e. groups should not be formed just to receive handouts. Business development must take place at the same time as institutional development or farmers will see no point in the latter.

Managing business groups. The capacity of farmers to successfully manage business groups remains unclear. Where doubts exist, it is better to

link farmers through existing channels or to limit groups to activities not requiring financial transactions. Groups require strong leadership skills (but how can the availability of such skills be assessed?) At the same time farmers may become jealous if leaders get financial advantages. There is a need for the clarification of group legal status to facilitate contracts and bank accounts. Training in group organization and management, account and record keeping, contract negotiating, and planning and logistics, is essential.

Financing. There is a need to address farmer financing requirements by working with existing financial institutions. Credit is insufficiently available for smallholders and small and medium sized companies seeking to upgrade. Innovative financing mechanisms need to be identified to support smallholders in particular.

Promoting sustainability*.* It is critical to assess whether such interventions can be sustainable, replicable, and suitable for scaling up. "Repairs and maintenance" and lengthy "hand-holding" are often required. Companies may have to invest in sustainability by having field staff and supporting groups or linkages may collapse after the NGO or donors leaves. Let farmers concentrate on what they are good at, namely, farming, and leave business activities to the specialists. Many external linkage activities have a large number of partners who may not always share the same approaches or motives. There is a need for realism in planning and expectations. Project implementation and design should recognize the need for flexibility and the need for learning from mistakes - that's how the private sector works. There is a need to avoid significant subsidies. If it's not profitable, it's not sustainable.

4 Emerging Issues for Agri-Food Value Chain Development in China

The formation of the agri-food supply chains is one of the options for overcoming entry barriers induced by supermarket chains, and is faced with many emerging issues.

6.1 Leadership Vacuum in the Chain

It is clear that a successful chain often has an effective 'channel manager' - a role often taken by a supermarket in developed countries. This corresponds to a concept of global commodity chains discussed by Gereffi (1994). By explicitly focusing on the coordination of globally dispersed, but linked, production systems, Gereffi has shown that many chains are characterized by a dominant party who determines the overall character of the chain, and as lead firm(s) become responsible for upgrading activities within individual links and coordinating interaction between the links. This is a role of governance, and here a distinction is made between two types of governance: those cases where the co-ordination is undertaken by buyers (buyer-driven commodity chains) and those in which producers play the key role (producer-driven commodity chains). Many modern chain stores in China are still at the early stage of corporate development where the cost of building and operating independent produce distribution centers is still not economically feasible or at least not feasible in every market location. As the number of stores

increases to a certain level, the champion role of supermarkets in defining the chain will likely enlarge as will their unique role in agricultural and rural development in China.

6.2 Lack of Effective Intermediaries to Link Small Farmers with Markets

It is realistic that many small farmers would not be able to sell directly to supermarkets. The changing distribution system poses major challenges to agri-food systems in China. In order to survive in this increasingly competitive environment, distribution and production companies including farmers must respond to these challenges. The development of modern retail and service outlets also creates huge opportunities for these who can adapt or the new entrepreneurs.

6.3 Collective Action Challenges for Small Farmers

Farmer cooperatives are at the initial stage of development in rural China. Most of them are not truly cooperatives according to modern definitions of farmer cooperatives. There are many problems facing the present farmer cooperatives. They can be traced from ideological/political and legislative sources as well as from institutional sources. One is the potential conflict between commodity organized farmer cooperatives and the existing village organization. The village organization seems, for several reasons, to be increasingly unable to meet the demands of modern food markets. It seems crucial to separate its economic function from its social and political function.

To efficiently organize farmer input and output markets, large enterprises, organized according to commodities, may be needed. The village basis may become too small to reap the benefits from large-scale operation of the farm related commodity markets. Conflicts might not only arise between farmer cooperatives and village organizations, but also between farmer cooperatives and the local grain bureau (i.e. the state grain firm) and the so-called Cooperative for Agricultural Supply and Marketing (CASM). Further development of farmer cooperatives is critically contingent on the political will of the central government in China. As most people are not familiar with the true nature of the farmer cooperatives, it is desirable to start up a training program supported by the government and by the participation of academic institutes and professional research centers.

However, although the FPCL is in line with internationally accepted cooperative principles (Munkner 2006) and the language in model bylaws of cooperatives in China is nearly identical to that found in international cooperative literature (USDA 2009), the critical features that distinguish cooperatives from other business organizations are neither properly regulated nor enforced. As a result, the cooperative movement in China does not quite fit the European/North American model, nor does it fits the Japan/S. Korea/Taiwan model (USDA 2009). The development of farmer cooperatives exhibits unique Chinese characteristics (Zhao and Chen 2012). Most co-operatives are initiated from the top down by officials, companies, large farmers or some combination of the above rather than by the spontaneous coordination of small farmers combating common problems (Shen, Rozelle,

and Zhang 2005; Huang, Xu, and Yu 2006; World Bank 2006; USDA 2009, Zhang 2009, Zhao, Chen and Fock 2010).

The majority of farmer cooperatives are organized by non-farmers, most commonly government officials or leading agribusiness enterprises. Farmer led cooperatives are usually headed by a large wealthy households with significant economic and political influence in their village and township. Most farmer cooperatives are organized in the "company + households" (C+H) model, with a leading company and other key shareholders (e.g. government officials) controlling the shares in the cooperatives. As a result, the small farmers who make up the majority of the members have very little participation or control in these organizations. The C+H cooperatives provide a large degree of control by the company (i.e., the agro-processor) over the decisions made by farmers, which are crucial to meet the coordination needs of the modern supply chain. These heterogeneous – or mixed – membership cooperatives (i.e., cooperatives with both farmers and agri-business firms as members) are favored by local government, and therefore, receive a great deal of support from local officials, including tax breaks and subsidized interest on loans and grants. These C+H models appear to be dominating the developmental path of farmer cooperatives in China (Zhang 2010, Huang, Xu, and Yu 2006). In contrast, farmer self-help groups remain marginalized.

6.4 Inadequate Financing for Value Chain Development

One of the major drivers that facilitate small farmers' participation in the agri-food value chain is the availability of and access to innovative financing. The types of value chain financing vary, depending on whether the flow of financing is from within the chain segments, or between and among chain actors, or obtained from outside the chain, which is related either directly or indirectly to linkage arrangements in the chain. Although the array of financing instruments used in these various types of agri-food value chain (AFVC) financing is not new, the emerging providers of finance do not mainly come from formal financial institutions. The innovative application of various institutional, contractual, managerial, and technological arrangements is also essential to adapt to the needs of agri-food value chains for stronger and more demand-driven value chain coordination. Whether these novel arrangements respond to the effective demand for AFVC financing of smallholder farms and meet their investment threshold needs, will need to be examined.

6.5 Problematic Contract Governance

There has been a gradual and incipient shift away from the use of spot markets toward the use of contracts but contracts between farmers and supermarket and fast food chains or between processors and supermarket or fast food chains are rarely studied. Many outstanding issues are associated with contract pricing, enforcement, and dispute settlement.

Formula pricing schemes are common for production under contract and involve transactions where the price is determined by formula and may be tied

to a specific market price. Many performance incentives exist. The structure of contracts usually consists of a payment system containing three components: 1) the base payment; 2) a performance payment; and 3) disaster payments.

With the increase of contract farming, there have been growing contracting problems in vegetable production, including price discovery and fairness, possible abuse of market power, contract conflict, and dispute settlement. For example, from the perspective of processors or distributors, contracts are not enforceable when the prevailing market offer is better than the terms offered in the contract. It is simply too costly to sue a farmer if not simply impossible if farmers decide to renege. From the perspective of farmers, buyers are often accused of downgrading the produce that farmers sell when the prevailing market offer is worse than the terms offered in the contract. There is no effective dispute settlement mechanism. Another concern over the increase in contract agriculture is a potential lack of transparency regarding the term used in contracts. This concern can be addressed by requiring that contract terms be made public.

Accompanying the increase in the use of contract farming has been an increase in the number of disputes between producers and processors over the terms of the contracts, which, in turn, requires a better contract law.

6.6 Stakeholders' Inability to Build and Maintain Partnerships

The changing distribution system poses major challenges to the competitiveness of agri-food systems in China. Those who will compete best in this evolving agri-food system are those who 1) understand consumer needs and wants, 2) can employ skills and technologies to gain efficiencies, 3) have access to infrastructure, 4) can deliver goods in the quantities and according to the timing schedule required by the end-users, and 5) forge reliable and mutually-supportive relationships up and down the supply chain.

7. Public Sector Opportunities, Knowledge Gaps and Recommendations for the Government and Donors

7.1 Public Sector Opportunities

A fundamental strategic choice is what role the government has in the development of value chains as it has several basic choices to make with respect to value chains as a strategic priority. The choices are these:

1) Do Nothing - with this choice some value chain formation will occur as a natural development of the marketplace and small farmers will be left to fend for themselves in the marketplace.
2) Regulate the market - to regulate the actors and actions driving the concentration and multi-nationalization, which in turn drives competition and the changes in institutions, organizations, and technologies that small farmers are finding so challenging.

3) Take Strategic Action - Action to initiate value chain formation in a pro-active manner and to help enable poor farmers to compete.

New markets and new market segments, new products and new services can be best developed through partnerships among suppliers, input providers, marketers and customers in the chain. However, to take advantage of emerging opportunities, investments are required. The challenge is that dealing with these challenges exceeds the capacity of most single companies. It is clear that the development of local value chains has been embraced as a new strategy by the government and by industry to promote rural development. Various national and regional programs have created policies and programs to actively encourage companies and farmers to consider supply chain strategies. China has such a national strategy.

These efforts merit the support of government and municipal authorities, as well as of NGO's or international organizations and could well serve as an example for other initiatives worldwide. Government efforts should be geared toward helping small farmers and intermediaries to adapt their supply to the requirements of the present (and foreseeable) standards and requirements of consumers and modern retail. Initiatives on good farming practices (including standardization), agro-industry and packing/storage/transport/handling practices (including cleaning and classification) accompanied by certification and quality seals have been a focus of government agencies in the last few years and should definitely be continued. Encouraging different forms of associations in order to pool production volumes is needed. An effort should also be made to better understand the impediments that small-scale farmers face to sell through the wholesale markets on the one hand, and identify which other sales channels they are presently using, on the other hand and gear actions to improve access to or develop both (Dirven and Faiguenbaum, 2003).

There is also a great challenge to encourage the formation of more local value chains to regional supermarket chains that include small and medium scale-farmers and processing industries. The reasons for the present by-pass of local wholesale markets should be better studied and hopefully partially reverted, since the transportation back and forth of bulky and perishable fruit and vegetables does not seem particularly efficient from a purely economic point of view, although it certainly makes sense from a private economic point otherwise transporters would not do it.

There are many public sector opportunities for correcting market failures. This therefore begs the question, are there market failures in closely coordinated agri-food sectors, and if so, what is the appropriate role of the public sector? Market failures, such as public goods, information asymmetry, market power, and poverty are all relevant for tightly coordinated supply chains in developing countries like China.

Although the private sector should be responsible for organizing the production, processing, and marketing of agricultural products, the government must play a role in guiding and facilitating this development.

Governments can improve efficiency by providing an appropriate macro-economic framework as well as necessary public goods, such as roads, and suitable policy and legal environments. One of the biggest challenges to address is how to develop policies, institutions and services to foster value chain development outside the context of interventions such as those discussed in this paper.

Governments should concentrate on developing an environment that can enable the private sector to function in a competitive way. Incentives to invest are provided by good monetary policies, which can lead to low interest rates and stable exchange rates. Attention may also need to be paid to existing taxation and tariff structures that may discourage investment. Unfortunately, governments often seek to move beyond facilitation towards direction, by taking over decisions about areas in which investments are made. The choice of target enterprise is often made in association with the international financial institutions. Loans for new or existing industries tend to distort competitive advantage, with investments being made in some sectors and in some chain actors on the basis of political rather than economic criteria. This acts as a disincentive for purely commercial investment and, if misguided investments promote market surpluses, can also increase the risks that farmers face (Shepherd, 2007).

Service provision by governments can also undermine commercial service providers. China continues to compete somewhat against the private sector in input supply, despite the theoretical liberalization of the input sector. With national and agricultural development banks in place, it may minimize any incentive commercial financial institutions may have for developing loan products suitable for farmers. Provision of services by governments is best justified for demonstration purposes when there is a clear example of market failure, i.e. in the, possibly rare, cases when viable economic activities are not being carried out. Even here, governments would first need to assure themselves that market failure was not due to failings in the enabling environment. Policy must be consistent, particularly where sizeable investments are made on the basis of policy changes.

7.2 Knowledge Gaps

When conducting impact assessments it is important to consider the relative contribution that the agri-food value chain development can make to tackling poverty, the cost effectiveness of the approach compared to other kinds of interventions, and what else needs to be done in a particular situation to tackle poverty. To be effective, agri-food value chain development needs to be supplemented by changes in development policies and co-ordination with other development actors, funds and initiatives to raise rural livelihoods to a more sustainable level. To make it an effective development tool, there are at least three knowledge gaps that need to be addressed immediately.

***Lack of Basic Data on Agri-food Value Chain*.** The majority of the studies on agri-food value chains are based on key informants. There is a lack of systematic data describing the nature of vertical relations, including on how

the extent of contracting in China seriously impedes the ability of policy-makers, industry stakeholders and researchers to monitor and evaluate developments in the sector. The collection and analysis of primary data on the nature of vertical linkages in China should be a priority for the public sector. A stacked survey approach proposed in Reardon et al. (2012) offers a promising starting point.

Lack of Validation on Best Practices of Agri-food Value Chain Development. A comprehensive review needs be done to: (1) develop an inventory of best practices; (2) understand the processes that lead to their successes; and (3) map the underlying drivers and conditions for their success. Best practices will need to be validated and piloted in order to disseminate sustainable agricultural knowledge, technology, and management practices. Farmers, extension staff, government staff, representatives of civil society organizations, and private companies will be involved in a partnership to adapt the best practices of agri-food value chain development to local conditions.

Lack of Systematic Evaluation on Specific Policy Initiatives. A monitoring and evaluation framework is a key learning mechanism in any development strategy. It serves to assess progress against stated goals, and also to help identify weaknesses and strengths in past approaches and hence opportunities for improvement in the future. For these purposes, the selection of indicators has to be linked to the analytical framework used in the strategizing process. This is particularly critical for providing a basis for analyzing cause and effect relationships, and for identifying why indicators changed the way they did, how much of the change was due to planned interventions, and what could be done better in the future. The critical choice is methods to be applied in evaluation. The right evaluation methodology will allow us to obtain credible estimates of the impacts of the proposed interventions to the identified bottlenecks. There is limited evidence on the program's effects. The evidence available often suffers from serious bias due to compounding effects, particularly in large-scale interventions.

7.3 Policy Recommendations for Agri-food Value Chain Development

Regular Consultations with the Private Sector and with Linking Organizations

Governments are recommended to organize regular consultations with the private sector and with linking organizations in order to identify and address concerns about policy and the legal and institutional frameworks. Formal mechanisms for such consultations, such as inter-professional commodity associations, should be promoted.

Rationalization of Land and Machinery Rental Markets to Empower Smallholders

To remain competitive, Chinese farms must grow in size. Given current farm sizes, rising total factor productivity in agriculture alone is unlikely be sufficient

to close the income gap with non-agriculture. Facilitating land consolidation will be key for the development of a modern smallholder agriculture. The trend in land rental, from 7% of agricultural land in 2000, to 24% in 2011, is very encouraging. In the more developed eastern provinces such as Zhejiang, it even reaches as high as 40%. As reported earlier in the case studies, there are complete village reorganizations into large, company-run farms whereby remaining villagers give up their land in return for lifetime compensation.
Recent evidence underscores the singularity with which land certification can increase productivity (by up to 30% percent), not so much through increased investment, but rather by fostering urban migration and freeing up land for rental by those specializing in farming. Enhancing rural social protection will also help free up land for renting, as will the removal of remaining barriers to labor mobility. When the latter is accompanied by small and medium town development, part time farming could also be promoted, especially in mountainous areas where opportunities for land consolidation are more limited.

Moreover, machine rental markets can significantly help smallholders achieve economies of scale through mechanization, which is necessary to overcome rising labor costs. While remittances and informal credit largely sufficed to finance modern inputs in the past, mechanization of (especially) grain cultivation will require greater access to bank capital in rural areas. But credit market imperfections can also be mitigated through institutional innovations such as machine rental. . The government has rightly been supporting the development of machine service delivery organizations, though credit for leasing might be more optimal than direct subsidization of machinery. The pressure to mechanize underscores the need to reform the rural finance sector, with the government focused on creating the infrastructure and market environment for rural finance instead of direct public provision of financial services.

The Use of Institutional Innovations to Benefit Small Farmers

Cooperatives need to be monitored and steps taken in order to better protect the interests of minority shareholders, and to maximize their potential in addressing low income problems for farmers. Land shareholding cooperatives or companies are interesting value chain financing innovations that likely benefit small farmers.

Regulatory Issues Related to Competition and Contracting

We draw much of this section from Shepherd (2007). There are many legal issues that governments should address in order to promote agribusiness development. Specific to market linkage activities is the need to clarify legislation relating to farmer groups and cooperatives. Though China passed its new law on farmer cooperatives in 2007, given that the concept of farmer groups as business entities is relatively new, China still needs to review and enhance legislation. Contract farming companies entering into agreements with cooperatives also have to be sure that the cooperative is on sound legal footing. Of broader concern is the question of laws of contract and the ability

to enforce agreements in the courts of law. Unfortunately, it is at this point that legal arrangements often break down. Furthermore, contract laws are of limited utility for businesses seeking to obtain repayment of loans from farmers who have practiced extra-contractual marketing, given the small sums involved. Conversely, small farmers will never have the means to bear the costs of fighting large companies in court. The use of third-party arbitration, e.g. by industry associations, may be one way of addressing this problem. Increasing attention is being paid to the possibility of establishing inter-professional commodity or industry associations, which can provide a focal point for discussions about individual industries and can play an important role in supporting farm-to-market linkages. Such associations should draw their membership from all relevant sectors of an industry.

Strengthening the Provision of Rural Public Goods

We draw heavily in this section from Shepherd (2007). Governments should address the need for institutions that can support agribusiness development. Areas that should be addressed include market information, agricultural extension, export quality certification and other quality control measures, agricultural research support and farm management and agribusiness training. More attention needs to be paid to food safety issues. Despite enormous efforts, frequent food safety scandals continue to damage public health and undermine consumer confidence in Chinese agricultural produce, at home and abroad, preventing China's agriculture from fully benefiting from the opportunities that the rising domestic and international demand for high value products present. While food safety problems are not unique to China, they must be addressed more forcefully. This will require greater awareness and induce agri-food industry to take up their responsibility to upgrade the whole value chain. To implement this agenda the capacity of both the public and private sector will need to be further strengthened. Other areas in which governments can contribute to providing an effective enabling environment include introducing regulations relating to pesticide use, food standards, seed quality and provision of arrangements to certify quality, geographic origin, etc.

Investing Rural Infrastructure

Most studies identify the lack of suitable infrastructure as a major constraint to linkage development. The role of governments should be to develop infrastructure. Clearly this is an easy recommendation to make. In reality, governments have limited resources and many claims on those resources. Given these resource constraints, funds earmarked for agriculture should be used to develop rural infrastructure and support services, rather than for politically inspired subsidies that are unlikely to have a long-term development impact. Reliable power and water supplies are vital for agro-processing and the export of fresh produce. Good feeder roads are particularly important for perishable crops for export and for crops that require processing soon after harvest. In the past, government provision of communications infrastructure was considered to be vital but with the rapid expansion of mobile phone services the government's role is moving from being one of service provider to service facilitator (i.e. by promoting competition and not imposing

unnecessary restrictions on the private sector provision of mobile phone networks). In China there has been rapid development of wholesale markets in both rural and urban areas and it has been under increasing consolidation under rapid urbanization. Governments should review the adequacy and availability of rural market infrastructure, particularly assembly markets, and plan improvements as necessary.

7.4 Recommendations for Designing Market Linkage Projects

The recommendations below, drawn mainly from Shepherd (2007) and SFAGM (2009) are not intended to be a comprehensive list and are not intended to substitute for a review of the factors that may improve the likelihood of success of linkage activities in China.

Identification of a feasible market. There have been undoubted successes with the linkage of small farmers to export, organic and fair trade markets. However, little is known about the returns from such markets when measured against the costs of the support provided by external agencies. Standards imposed by both the private sector and governments, certification requirements, and the growing need for traceability all impose high costs that are difficult for small farmers to absorb. It is critical to quantify the costs of activities that link farmers to markets and comparing these with the benefits that farmers receive, particularly after the withdrawal of governmental, donor and NGO support. It is recommended to carry out detailed evaluations of project costs and evaluate whether this is the most appropriate form of support to improve marketing by farmers.

Nurturing farmer entrepreneurs or lead farmers. Entrepreneurship depends on individuals understanding cost-benefit ratios, and being able to evaluate market opportunities and associated risks. Facilitating farmer entrepreneurship will also require careful nurturing of grassroots initiatives, and may involve establishing or supporting networking and brokering services. Nurturing entrepreneurship needs to go well beyond this and should include support to lobbying and advocacy for enabling institutional environments. In fact, the whole debate around rural entrepreneurship would be much more helpful if it focused more on the conditions that enable farmer entrepreneurs to develop their business..

Involving the private sector through a value chain development approach. It is important to work with the private sector. Successful linkages require trust between all parties and such trust cannot be achieved if their private sector partners are not to be trusted. Similarly, one should resist the tendency to try to set up farmer-controlled marketing organizations to compete with the private sector. Donors need to improve communication with the private sector in order to obtain a fuller understanding of how private companies and individuals work, the constraints they face and the costs they encounter in doing business. One needs to work with so called dragonhead companies effectively to ensure the benefits of smallholders.

Gaining support from local county leaders. The governance structure in China points to the importance of the county leader in determining whether or not a donor-driven project would be a success. Attention should be paid to developing a relationship between the project and the development priorities of the local county. Donor-funded projects are typically in a good position to develop such a relation. Close ties with the county leader can therefore help create a supportive local environment and ensure the success of the project.

Avoiding the subsidy trap. When donors, NGOs and others recruit expensive international, or even national, expertise to support relatively small groups of farmers, this already represents a considerable subsidy. However, there is often a temptation to introduce further subsidies even though activities based on subsidies rarely prove sustainable. When to employ subsidies is clearly a complex question and not easily resolved. Organizations are recommended to carry out detailed and realistic cost-benefit calculations and only provide subsidies when the underlying venture is clearly profitable on a sustainable basis and would generate sufficient surplus to enable subsidized components to be replaced on a commercial basis when required. Many organizations are often tempted to provide credit directly to farmers. They may even provide that credit "in-kind", so bypassing commercial input dealers. While such input supply arrangements are valid for companies contracting with farmers, particularly if farmers have no alternative market outlet for their produce, credit arrangements some can lead to problems of sustainability. The provision of credit requires specialist skills and linking organizations are recommended to link farmers to an experienced financial institution (bank or microfinance organization) wherever possible.

Collective action is not always essential. There is strong theoretical and some practical evidence that group activities are beneficial. However, this may not always be the case. The selling of staples to local markets may yield few returns from formal collective marketing activities, although farmers may benefit from informal activities to bulk up products. Farmer organizations and groups must be seen as a means to an end, not as an end in themselves. Linking organizations are recommended to conduct detailed analyses of the socio-economic situation of the farmers and detailed studies of the relevant supply chains before deciding on whether or not to organize farmers into groups. This has aparticular relevancy for China as many rush to establish the cooperatives for the sake of cooperatives.

Having one's own field staff for the linkage project. There is a wealth of experience in the areas of linking farmers to markets and associated activities such as group formation. Unfortunately, the information that would enable donors, NGOs and others to learn from that experience is not widely available. It is important for the linkage project to have its own field staff that allows for timely coordination with partners along the value chain, summation of good experience, and sharing of good lessons or failures. It is also critical to have one's own staff to identify synergies with existing and potential projects and to address any emerging issues.

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8.1 Appendix A

Table 1 Case Study of Market Linkages

Case	Typology	Description
Specialized pig raising households in Yangshan, Guangdong	Linkage through specialized farmers	Specialized households build livestock raising barns with special loans from the Poverty Alleviation Office. To qualify for the loan, the specialized household needs to link with 1-3 poor households. Instead of giving the funding to the household directly, the Poverty Alleviation Office remits the funding to the leading company to which the specialized household sells its livestock. The funding is recovered through the sale to the company from the household.
Village brokers in Laizhou	Linkage through local traders	In recent years, emerging farmer brokers in Leizhou have become active from the planting to the harvest seasons. They go to farmers to purchase and sell products as well as to transmit information. As a result, they provide a bridge for many farmers to the market.
Beijing Xiaotangshan Vegetables Company	Linkages through state-owned traders	Xiaotangshan was identified as the special vegetables supply base area for the Beijing Municipal Party Committee and Municipal government in 1995 and it has become the special vegetables supply base area for the state council. The so-called special supply base area is the designated farm used for supplying vegetables to government leaders at higher levels. In order to ensure the health of the leaders, only the most reliable farms can be designated as special supply base areas.
Shanghai Jihong Vegetable Delivery Center Co Ltd	Linkages through private traders	The company's owner started as a vegetable street vendor in 1984. In the early 1990's, it started to supply vegetables to starred hotels and restaurants in Shanghai. Many vendors were not willing to deliver to these hotels and restaurants due to a 15 day period of payment on credit, the possibility of goods being rejected, and trouble associated with delivery. The owner maintained the company's business with hotels and restaurants and focused on building relationships and trust with them.
Gushi Model, Xinyang, Henan	Linkage through "Company+ Household" Cooperatives	In 2007 a few chicken farmers initiated the formation of cooperatives and signed an egg supply agreement with a local leading enterprise San Gao Agriculture and Animal Husbandry Co., Ltd. At the same time, the cooperative signed agreements with Yangjidahu as the core member. Under the agreement, San Gao enterprise provides day-old chicks and feed to the members of the cooperative, the cooperative sells all eggs to San Gao enterprise. The Gushi chickens from the cooperative are sold directly in the open market.

Case	Typology	Description
Shengfeng Green Agri-food Growing Association, Wuchaun, IMAR	Linkage through a farmer association to distribution center	Thus Xing Linmei has established long-term cooperative relations and friendships with the wholesalers from other places. In each potato-harvesting period, the wholesalers from other places come to meet Xing Linmei and Xing provides them with accommodation. Xing Linmei helps them to purchase potatoes from the villagers, and collects brokerage charges from them according to tonnages of each truck, the brokerage charges for each truck of potatoes are 20 USD. Besides, Xing Linmei herself also purchases potatoes from the villagers and then transports these to markets in Beijing and other cities.
Tianyang Agricultural product Wholesale Market, Tiangyang, Guanxi	Linkages through wholesale markets	Guangxi Tianyang agricultural products wholesale market (Tianyang wholesale market) is the largest origin agricultural products wholesale market in southwest China. It has become the main form of local economic organization and promotes local economic growth and social development. Cooperating with other agricultural associations, Tianyang wholesale market has linked household farmers to the market. First, farmers or wholesalers bring their products (mainly vegetables or fruit) to the market. Then the local brokers collect those vegetables and fruit; perform the picking, sorting and packing. Finally the traders ship the products. The transaction involves the following parties: farmers as producers, wholesalers, brokers of agricultural products, long-distance traders etc.
Dairy Parks in Horinger, IMAR	Linkages through “parks”	A typical dairy park is built on a lot that can accommodate about 500 cows with about 20 small farmers. Individual farmers could either rent or buy the stalls in the park.
The Nestle Model in Heilongjiang	Farmer to agri-food processors	Nestle in China has developed a quality assurance system in which most of its milk is supplied by small scattered family farming and hand-milking in Shang Cheng, Heilongjiang. Nestle’s intervention starts at the gate of the milk collection center, bulk milk delivered from individual farmer households is sampled and physically checked, which includes density testing to avoid counterfeits at the milk collection center, more comprehensive lab testing will be done in the factory afterwards, and the testing results and price matrix will be published on the wall of the milk collection center in the next few days.
Shanglin Village Land Shareholding Cooperative	Linkage through shareholding cooperatives	In early 2006, 117 farmers from three teams of Shanglin village and also the former collective economic cooperative formed “Shanglin Land Shareholding Cooperative” with 16 hm2 (240 mu) of land as equity. The cooperative was renamed “Shanglin land shareholding agriculture professional cooperative” in 2008. One mu was valued as one share with a price of 5000 yuan per share, for a total of 240 shares, making the registered capital of the cooperative 120 million yuan.

Case	Typology	Description
Dalian Xiangyin Agricultural Development Co., Ltd.in Liaoning	Linkage through land shareholding companies	Since 2001 Chengxi village, Jinzhou district, Dalian city has actively explored ways to use farmers' land as equity to form an agribusiness company. Collective land, capital, agricultural facilities, and the farmers' land are incorporated as business investments and together form Dalian Xiangyin Agricultural Development Co., Ltd.
direct linkage between farmers and universities in Hubei	Linkage through institutions	In December 7, 2012, Yunmeng county supply and marketing cooperatives in the Temple vegetable growing professional cooperatives and Hubei Engineering University in Xiaogan City, signed a "Farmer-to-School" agreement. The agreement requires Yunmeng to supply 1.7 million kilograms of vegetables, 1 million kilograms of rice, 0.4 million kilograms of noodles, 0.18 million of eggs, 0.05 million kg of live chickens and 0.14 million kg of fresh fish. This is one of the very first cases of "farmer-to-school" linkage in the country.
Xiabu Xiabu Co, Ltd, Beijing	Linkage through fast food chain	Xiabu Xiabu has established cold chain logistics and distribution centers in collaboration with agricultural cooperatives. Before noon the day before, the restaurant store orders from the logistics and distribution center through the system, these orders are then sent directly to the base; where, that very same afternoon, picking and sorting are carried out, and at midnight that evening the vegetables are transported to the point before 8:00 p.m. Vegetables are distributed from the field to the restaurant outlets within 24 hours.
Carrefour's Direct Purchase Program	Linkage through Supermarkets	There are two patterns of farmer-to-supermarket procurement in Carrefour. One pattern involves setting prices once a week. The other is called "annual break-even price." The former involves suppliers or farmers' cooperatives that sign trading contracts sending the details of products that they are able to sell to Carrefour headquarters negotiators via fax, email or mobile message. Upon receiving the information, negotiators will gather, sort out and send them along to CCU. CCU then receives the information, counts and gathers the demand in every branch supermarket and gives the orders to farmers' cooperatives through the headquarter negotiation department. Next, the cooperatives will deliver the products. The latter pattern takes place at the beginning of every year, at which time Carrefour headquarters will negotiate with the cooperatives. Cooperatives set fixed prices for the products and Carrefour will offer annual order plans according to the price. Carrefour also gives advance payments of a certain proportion to help cooperatives maintain stocks.
Emerging Sino-Japan Vegetable Value Chains	Farmer through exporter	Japan has one of the strictest sets of standards in the world. These standards mainly relate to appearance, size and packaging. Vegetable exports to Japan must be in accordance with the labeling system of the JAS Law including barcode and the place of origin. Moreover, shipping vegetables to Japan requires the use of a dry container or an air-controlling container.

Table 2 List of Public Market Linkage Programs in China

Program	Description
Wholesale market development and upgrading	Wholesale markets have been an important outlet for small producers in China since the 1980's. The most rapid development in the wholesale market was observed in the 1990s. Wholesale markets have been established in every major town and city in China. The urbanization and rapid diffusion of supermarkets started during the 1990s, however, has started to affect the functioning of wholesale markets. Upgrading traditional wholesale markets has become a key policy initiative for the government.
Direct "farmer to supermarket" purchase program	In 2007, the Chinese Ministry of Commerce initiated the "farmer-to-supermarket" (FTS) program to promote direct links between farmers and supermarkets and to improve farmers' ability to access modern markets. Since then, the FTS has been an important element of China's agricultural and rural development strategy. It is an ambitious program and an innovative response to the chronic problem of low farmer incomes. Its innovations consist of the following: 1) it operates at scale – as a national program it operates in fifteen provinces of China. In 2010 it had a budget of approximately $2 billion; 2) it is a unique partnership among farmers, the government, and business entities; and, 3) it encourages market development in the localities in which it operates.
Promotion of Farmers' Cooperatives	Since 2002, there has been a big push to promote the development of farmer organizations such as through commodity associations and farmer cooperatives in China. In 2003, both the Ministry of Finance (MOF) and the Ministry of Agriculture (MOA) spent about 80 million RMB to support the development of farmers' cooperatives. The Farmer Cooperatives Law has been in effect since 2007 and clearly articulates the legal status of farmer cooperatives and their development specifications. Articles define the government's basic policy to support the development of cooperatives through financial support, tax incentives and support of financial, technology, talent, and industrial policy guidance and other measures.
China's "Dragon Head Enterprise" Policy Framework	The central, provincial, and local governments have announced a number of measures to promote agro-industrialization. The Office of Agro-Industrialization was established to promote a coordinated system and a so-called dragonhead company policy framework. The Office is stationed in the Ministry of Agriculture and coordinates with nine ministries. The main objective of the policy initiative is to promote the linkage between small farmers and larger markets. It now has 500 national level dragonhead companies selected on the basis of many criteria.

Program	Description
China's Push on Agri-food Industry and Technology Parks	Park-led industrial chain financing, relying on vertical integration between suppliers, manufacturers, vendors, service, as well as professional associations and cooperatives, meets the financial needs of the agricultural industry stakeholders. The model relies on agricultural business entities within the industrial clusters and on the interdependence of information, resources, technology, and sale channels to ease the credit risk of agriculture and to improve the incomes of financial institutions.
New Food Safety Law and Challenges Ahead in China	China's new food safety law was passed on February 28, 2009. The law came into effect on June 1, 2009. Under the new law, government regulation and operator responsibility serve as the two cornerstones of ensuring food safety. The law seeks to clarify and streamline oversight between government agencies by giving the Ministry of Health (MoH) a greater coordinating role and establishing a National Food Safety Commission. MOH is now the sole agency responsible for information disclosure. Clearer definitions of responsibility between ministries and at the county level have been established. This should result in a reduction of redundancy and miscommunication. Nevertheless, China's disjointed approach to food safety has not fundamentally changed.
Government Sponsored Agri-food Distribution Centers	The Government of Zhejiang sets a strategic goal of integrating resources to focus on providing assistance to market agricultural and food products produced in Zhejiang. The key objective is to help farmers in Zhejiang to get their products into supermarkets. One of the plans is to establish 60 marketing centers, 20 agri-food distribution centers, and 5 exhibition centers in the province over the next five years. The investment for the distribution centers will come from both the government and the private sector. The government is prepared to invest about 60 million RMB in the next five years to establish the distribution centers. The center will run like a private company with initial funding support from the provincial government.
Government Sponsored Market Linkage Initiative through Colleges	On November 5, 2009, the General Offices of the Ministry of Education (MOE), the MoA, and the MOFCOM jointly issued a guidance document titled "Notice about establishing Pilot Linkages of Colleges with Farmer Cooperatives and Agri-enterprises". Under the pilots, farmers, farmer cooperatives, agri-enterprises and colleges sign an agreement, then farmers, cooperatives, and agricultural enterprises will supply agricultural products to colleges directly without any other intermediate links. Such direct linkage is expected to give farmers more stable sales channels and prices, and at the same time, reduces intermediate links and the marketing cost of circulation, and benefits the students through improved food safety and boosts farmer incomes.

8.2 Appendix B

8.2.1 Appendix 1: Case Studies of Market Linkages

Case 1: Linkage through specialized farmers – specialized pig raising households in Yangshan, Guangdong

Yangshan County is a poor county, located in northern Guangdong province. To assist poor rural households, the county has initiated a practice of linking the poor farmers with markets through the development of specialized farm households. Specialized households build livestock raising barns with special loans from the Poverty Alleviation Office. To qualify for the loan, the specialized household needs to link with 1-3 poor households. Instead of giving the funding to the household directly, the Poverty Alleviation Office remits the funding to the leading company to which the specialized household sells its livestock.

The funding is recovered through the sale to the company from the household. There are two ways for this to occur. First, the specialized households can hire the poor households to work. When the operation has stabilized (usually within two years), the poor household can participate as a shareholder. Second, the poor households can also develop their own livestock raising operation under the support of the specialized households. The Poverty Alleviation Office has a short-term relief fund available for the poor households under the guarantee of the specialized households. The specialized household can provide technical guidance to the poor households.

Xia Yankun is a specialized pig-raising household from Lingbei township under Wen's style pig farmer. Mr. Xia built a good pig-farming barn and the Yangshan County Poverty Alleviation Office supplied 25,000 yuan of pig-raising funding. In return, he needed to help two poor households. Mr. Ou Bing helped Mr. Xia raise the pigs with “a basic salary + bonus” incentive mechanism, while Mr. Cai Zeliang planted 27 acres of citrus “shatangju” as compensation in the form of labor. The pig farm sold its first batch of 480 pigs with an average gross profit of 161 yuan per pig. It helped pay off a 25,000 yuan loan from the Poverty Alleviation Office. Having had initial success, Mr. Xia Yankun decided to increase his investment in the partnership with Ou Bing to raise each batch of 1,000 pigs. Mr. Ou Bing is responsible for the farm’s management and owns 25% of the shares. The Poverty Alleviation Office has further provided loans for raising pigs but has requested Mr. Xia and Mr. Ou to support 2-4 new poor households. Ou Bing has not only escaped poverty, but has also become one of the new pig farm specialized households. Mr. Xia Yankun also used pig farms as collateral to obtain funding to purchase 5,000 citrus shatangju guomiao (seedling), to employ two poor households using "basic salary + bonus” incentive mechanism. The poor households receive a basic salary of 800 yuan and the dividend of 30% from the fruit sales.

Case 2: Linkage through local traders – village brokers in Laizhou

There are about 0.61 million registered village brokers in rural China that help market agri-food products (Lu Yana 2012). One third of them are full time professional brokers who are certified. For example, in recent years, emerging farmer brokers in Leizhou have become active from the planting to the harvest seasons. They go to farmers to purchase and sell products as well as to transmit information. As a result, they provide a bridge for many farmers to the market.

Yingli Town, with its fertile land, specializes in bitter melon, hairy melon, peppers and other vegetables. In the early 1990s, nobody engaged in the marketing of vegetables in the township. They began to produce vegetables roughly around the same time as farmers in Hainan, Lianjiang, and Xuwen. The competition tended to drive a large number of farmers to lose money from growing vegetables. Today, various townships of Leizhou have a number of brokers throughout the villages. There are typically a few farmer brokers in one village, which promote competition and help to increase the farmers' income.

Mr. Fou Long, a farmer broker for 14 years, single-handedly pulled the northeast merchants and farmers from more than a dozen local villages together, by selling thousands of tons of vegetables.

They not only opened the market to help local vegetable farmers, but also to provide farmers with the latest, fastest, most accurate market information. Timon village broker Xu Xun found that bitter melon should be grown using nursery transplants with improved varieties in order to achieve high-yields and early maturation. Xu Xun guided local growers to select improved varieties and reasonable arrangements for the picking period. Xu Xun also started a seed business with vegetable producers in the villages.

Case 3: Linkages through state-owned traders – Beijing Xiaotangshan Vegetables Company

Xiaotangshan Vegetables Company (Xiaotangshan) was set up in 1984 as a state-owned farm under the Beijing Agricultural Bureau, and in the process more than 20 ha of land was taken from Xiaotangshan Town, Shunyi County, Beijing on 70 years lease. The Beijing Agricultural Bureau made an investment of 125,000 USD. The fixed assets of this farm have increased to 8,125,000 USD now. The construction of the vegetables base area was proposed by Deng Xiaoping. Deng pointed out that the implementation of the reform policy and opening to the outside world will attract many foreigners to work in Beijing and that they would need local vegetables to eat. After the establishment of Xiaotangshan, many varieties of foreign vegetables have been introduced.

The vegetables produced are supplied to Friendship Department Stores and large hotels for foreign customers. Xiaotangshan was identified as the special vegetables supply base area for the Beijing Municipal Party Committee and

Municipal government in 1995 and it has become the special vegetables supply base area for the state council. The so-called special supply base area is the designated farm used for supplying vegetables to government leaders at higher levels. In order to ensure the health of the leaders, only the most reliable farms can be designated as special supply base areas.

After the mid-1990s, supermarkets in Beijing developed rapidly. Xiaotangshan has grasped this opportunity and developed the market by fully using its advantages. In 1999, Xiaotangshan began supplying vegetables for Xidan Wanfang supermarket, the first supermarket in Beijing. It began supplying vegetables for Xidan Department Store in the same year. In 2000, Xiaotangshan began supplying vegetables for Itoyakado, a Japanese supermarket. Xiaotangshan had special vegetable-selling counters in more than 70 supermarkets by 2006. Xiaotangshan's first vegetable base area was constructed in Shunyi County where the headquarters is situated. The first outreach base area was constructed in 1998 in Dasungezhuang of Shunyi County and then expanded gradually to Miyun and other areas in Beijing's suburbs. The first base area outside Beijing was constructed in Zhangjiakou, Hebei Province in 1994. The number of base areas outside Beijing increased to three in 2000 and they are situated in Hainan, Guangxi, and Zhangjiakou. In 2005, there were base areas outside of Beijing, including in Hebei Province (where there were 2), Inner Mongolia, Shandong, Guangxi, and Yunnan. Altogether, Beijing has 8 base areas (1 is in Shunyi, 2 in Pinggu, 4 in Miyun and 1 in Yanqing). At present, the number of varieties of vegetables grown exceeds 450.

The return from the produce sold in Xiaotangshan was 463,000 USD in 2000, more than 625,000 USD in 2001, 1,125,000 USD in 2002, 1,500,000 USD in 2003, 2,250,000 USD in 2004, and 3,250,000 USD in 2005. The income reached 3,750,000 USD in 2006.

There are 21 ha of land in the base area of Xiaotangshan headquarters and the vegetables produced here are specially produced for the State Council, Beijing Municipal Government and some hotels in Beijing. Beijing out-reach base areas are distributed over Shunyi, Pinggu, Miyun and Yanqing and the total area is 160 ha. The 6 base areas out of Beijing belong to about 1000 small-scale farmers, and Xiaotangshan manages these base areas through its own staff. Xiaotangshan is responsible for the management, production guidance, technical assistance, and supervision of pesticide and fertilizer use. The company also invites experts to give regular technical instructions. The leading staff of the company inspect the arrangements and progress of work every week. The company carries out professional and technical personnel trainings in base areas and more than 1000 personnel received training in 2005.

The negotiations between Xiaotangshan and Carrefour on cooperation with Carrefour's quality line, the green food within the Carrefour brand, started in April 2005. Staff in charge of Carrefour's quality line went to supervise the base area generally once a month but occasionally three times a month also. The main investigation dealt with factors such as the growing environment,

water sources, soil and air and these were tested to see if they met their set requirements. They also investigated the technical needs, management and production aspects and the use of pesticides by farmers. They asked Xiaotangshan to provide a written report on these items in detail. Carrefour gave Xiaotangshan the technical manual on vegetable production and also the packing manual prepared by Carrefour. These manuals contain all the details and requirements related to production, processing, and transportation of the vegetables of Carrefour's quality line. During the negotiations, Carrefour proposed that Xiaotangshan's production and management meet the requirements listed in the manual. If Xiaotangshan had difficulties meeting the requirements, the two parties could further discuss and revise the standards.

On September 10, 2005, the quality line vegetables produced by Xiaotangshan were formally sold in the market of Beijing Carrefour's Shuangjing chain stores. At first seven vegetables were produced under the quality line: cucumber, cherry tomato, large tomato, cabbage, sweet pepper, carrot, and potato. In January 2006, Chinese radish was also added to the quality line. With the success of trial operations, from 25 September 2005, the quality line vegetables produced by Xiaotangshan started to be sold in six Carrefour chain stores. Traceability is a key point of quality line vegetables. The operating method of traceability is that each greenhouse has a code number and detailed records. Field production records include details on field operations: fertilizer application, spraying pesticides, irrigation, volume of harvest, and raising seedlings, etc. The code number on the top right corner corresponds to the greenhouse code number. Therefore, the accuracy of the traceability in Xiaotangshan's operation is very high and the products can be traced to the greenhouse. The traceable code number of vegetables produced in Xiaotangshan is a 9-figure number in which digits 1-2 provide the base area, digits 3-5 provide the greenhouse number, and digits 6-9 provide the production date.

The traceability system of Xiaotangshan has the following characteristics: (1) All the plots have code numbers; (2) All the plots have field records; (3) All the farmer households have records; (4) Each box of harvested crop has a code number; (5) Each package has a traceability code number. Two pieces of important information can be obtained from the code number: (a) Producing area; and (b) The packing date. Through the packing code number, the supermarket can find the production area, the greenhouse, and the detailed information of the production place and corresponding greenhouse, the volume of harvest, and other information that can be used when problems occur. The benefits of a traceability system are: firstly, the area of production can be determined; secondly, once problems occur, the source of the problem can be determined quickly, and the problem can be linked/solved.

All of the products of the Xiaotangshan vegetable base area are tested before harvest and the vegetables can be harvested only when indicators of pesticides and fertilizers have been tested. Samples of the harvested vegetables should be tested again. Records of tests for the last three years are kept in the computer database of the company. The harvested products are packaged in boxes according to different varieties. Each box has a code

number and the names of farmers are printed on the same boxes.

Case 4: Linkages through private traders – Shanghai Jihong Vegetable Delivery Center Co Ltd

The company's owner started as a vegetable street vendor in 1984. In the early 90's, it started to supply vegetables to starred hotels and restaurants in Shanghai. Many vendors were not willing to deliver to these hotels and restaurants due to a 15 day period of payment on credit, the possibility of goods being rejected, and trouble associated with delivery. The owner maintained the company's business with hotels and restaurants and focused on building relationships and trust with them. The business was reasonably good until the Asian Financial Crisis in 1997. To improve cash flow, a new channel was needed.

In 1998, the owner along with another three vegetable suppliers was chosen to supply Metro. After one year, the owner was the only one remaining. The volume was growing and reached 4 tons a day. That called for a new way to manage his expanding business. He started to build a franchise-type of business. Each of his franchises supplied one Metro store. The owner of his franchisee was a typical husband-wife team and invested 150,000 initially. The amount was matched by 300,000 from the company. It typically hires 7-8 people. Each franchisee is responsible for its own profits and losses. The profit is shared 50-50 with the company. His initial strategy was to focus on volume instead of profit. The franchisee was asked to spend the first three months expanding its volume at a loss. The company now supplies vegetables to RT-mart, Leigou, NanGongSan, Lotus, Metro, and Time. In 2001, he also became a national supplier to Metro. The company now has more than 60 franchisees to supply 60 supermarket stores.

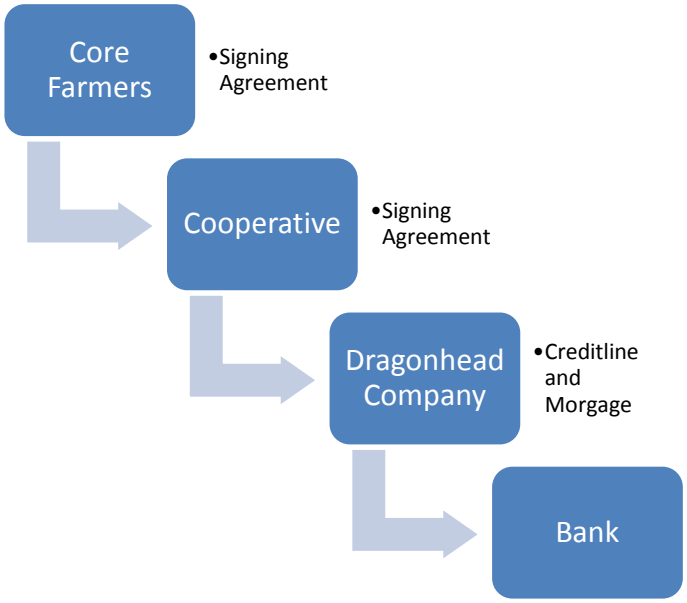
70% of its vegetables are now from vegetable packers, 10% from cooperatives, and 20% from individual farmers. It reached a total sale of 120 million RMB in 2002. The owner also senses the change occurring in Shanghai and foresees a change in the way he is doing his business. He is currently considering an alternative business structure in response to the need for bigger, and more numerous supermarket chains.

Cases 5: Linkage through "Company + Household" Cooperatives – Gushi Model, Xinyang, Henan

Xinyang applied the "company + households" cooperative model to help farmers enter the market. Gushi chicken is a nationally known local chicken breed. In 2007 a few chicken farmers initiated the formation of cooperatives and signed an egg supply agreement with a local leading enterprise San Gao Agriculture and Animal Husbandry Co., Ltd. At the same time, the cooperative signed agreements with Yangjidahu as the core member. Under the agreement, San Gao enterprise provides day-old chicks and feed to the members of the cooperative, the cooperative sells all eggs to San Gao enterprise. The Gushi chickens from the cooperative are sold directly in the open market. With the support of the International Fund for Agricultural

Development (IFAD) loans, the cooperative has started to support a number of supernumerary members identified by IFAD since 2010. The support has been provided to more than 700 poor households through seedlings and technical advisory services, driven by poverty alleviation. The original core members of the cooperative were 20 families and expanded to 56 existing core members. Among these additional core members of 36, about 16 are from 700 households supported by the IFAD project.

Figure 3 "Company + Household" Cooperative Financing Model, Gushi, Henan



To support the core members of the cooperative, it allows farmers to use the feed on credit, sell the finished chicken and then recover the funds. Another method of support is that, the members will cover the feed cost for raising the chicken for the first 60 days of the 120-day growth cycle and the cooperative will cover the feed for the remaining days. The Agricultural Bank of China Gushi Branch has given San Gao a credit line of 30 million as a secured loan to its downstream customers (Figure 3). However, for the recovery of the loan, and guarantee of supplies, these downstream customers must be contract farmers. Therefore, the formation of the leading enterprises + cooperative + contract farmer financial chain provides the core members with free mortgage loans. The line of credit is calculated at 50% of the farmer's requirement of liquidity.

Case 6: Linkage through a farmer association to distribution center - Shengfeng Green Agri-food Growing Association, Wuchaun, IMAR

Ms. Xing Linmei is the Chairman of Wuchuan County Kezhen Town Shengfeng Green Agri-food Growing Association. She was previously a material storekeeper of a construction brigade in Huhehot city. She returned to her village when she graduated from middle school. The conditions in the village were very hard and her family was very poor. In order to earn a living she approached the manager of the construction brigade. When he came to

know that she was from a rural area, he asked her to buy 10 tons of potatoes for the canteen. There were only a few farmers in her village growing potatoes at that time, so she could not fill the order. However, she had found that potato had great market potential and she grew 1.2 ha of potatoes the next year. After harvesting, Xing sold these potatoes to the construction brigade and was able to earn a good income.

The other farmer households in the village also noticed that potatoes produced by Xing were selling well and so, they also started growing potatoes. A bumper harvest of potato was obtained that year, but the potato growers were extremely worried about their sale. Under these circumstances, Xing Linmei went to the wholesale markets in Huhehot city to look for potato purchasers, and persuaded the wholesalers to come to the village to purchase potato and the potatoes produced by the village were all sold.

Thus Xing Linmei has established long-term cooperative relations and friendships with the wholesalers from other places. In each potato-harvesting period, the wholesalers from other places come to meet Xing Linmei and Xing provides them with accommodation. Xing Linmei helps them to purchase potatoes from the villagers, and collects brokerage charges from them according to tonnages of each truck, the brokerage charges for each truck of potatoes are 20 USD. Besides, Xing Linmei herself also purchases potatoes from the villagers and then transports these to markets in Beijing and other cities. Through her contacts, Xing Linmei distributes more than 40 trucks of potatoes to the wholesale markets. The loading capacity of each truck is about 35-36 tons of potato.

Xing Linmei participated in the “farmer organization training class” run by CIDA in 2006. Through this experience, Xing Linmei understood the need for farmers’ associations. After this training, she and other village participants organized a training class for other villagers who did not attend the farmer organization training, so that they could understand the need for such an association, and Shengfeng Green Agri-food Growing Association was established on April 14, 2006. The association provides high quality potato seeds to its members and purchases fertilizers and pesticides and other materials through cooperatives. In the potato-harvesting period, the association purchases potatoes from its members at a price of 0.25 cent/kg higher than that from other growers and then markets these potatoes to wholesalers from other places.

In the beginning of 2006, CIDA invited Dr. Hu Dinghuan from the Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences to carry out a strategic study on Wuchuan potato. In the research report, Dr. Hu proposed that the way out for Wuchuan potato is marketing the potato to supermarkets. In consideration of the shortage of distribution capacity, Dr. Hu proposed a two-step strategy. The first step is to market potato to supermarkets relying on the present suppliers of supermarkets in Beijing. The second step is to train a number of farmer associations or agri-food distributors with distributing capacity in Wuchuan County, and then the Wuchuan potatoes can be marketed directly to supermarkets. Dr. Hu

recommended several vegetable suppliers of supermarkets in Beijing and Shanghai to Wuchuan County, including the Xiaotangshan Vegetable Company in Shunyi District of Beijing. In view of Dr. Hu's report, the manager of CIDA in Beijing asked Liu Wenxiang the project coordinator to contact Xiaotangshan Vegetable Company. Liu Wenxiang went to Xiaotangshan himself very shortly thereafter and investigated the Xiaotangshan vegetable distribution center and vegetable growing base areas. Liu Wenxiang also invited the manager of Xiaotangshan to visit Wuchuan to examine the potato crop. In May 2006, Manager Wang from the Xiaotangshan purchasing department came to Wuchuan to make inquiries and Liu Wenxiang accompanied him to visit two farmer associations growing potato in Wuchuan County; Shengfeng Green Agri-food Growing Association and Wang Xilian's Potato Growing Association and showed him two potato growing base areas of each association. The aim of Manager Wang's investigation was to find out whether the potato-growing environment was polluted and whether the potato met their standards. Manager Wang also investigated the entire growing process of potato-farmer households. In a training class on the Sichuan agri-food supply chain run by CIDA (Sichuan Agricultural University), the participants – Manager Wang and Xing Linmei of the class, had heard about the supply. In September, before harvesting, Manager Wang came to see the base areas again. He asked the association to transport 10 tons of potatoes at 10-day intervals. Xiaotangshan has strict quality requirements, but the price is higher. On 2006, 15th September, a truck of 6.5 tons of potatoes from the association was transported to Xiaotangshan vegetable distribution center. When the packages were opened, Xiaotangshan found that the quantity of unqualified potatoes from Wuchuan exceeded 50%. Xiaotangshan's potato standards require that the appearance of the potato be good, the size uniform, and and the skin uninjured. There were many rotten, injured potatoes in the paper boxes. Manager Wang of Xiaotangshan was disappointed to see these potatoes, and refused to purchase them. Xing Linmei, who escorted the potato consignment, had to hire temporary labourers to select the acceptable potatoes. Ultimately, only 1.5 tons (from 6.5 tons of potato) of the potatoes met Xiaotangshan's standards. The association suffered a lot from this business, and Xiaotangshan decided to terminate the contract with the association.

The CIDA manager Liu Wenxiang thought that such a rare opportunity should not be abandoned rashly. Liu Wenxiang went to Beijing and negotiated with Xiaotangshan again. At Liu's behest, Xiaotangshan agreed to give the association another chance. One month later, in January 2007, the association transported a truck of 14 tons of potatoes to Xiaotangshan. As the association had learnt a lesson from its first experience, this time the acceptance rate of the potatoes reached more than 85%. The Xiaotangshan association was very satisfied and paid 0.23 USD /kg. The reason for the success this time was that the association had trained a number of inspectors and they selected the potatoes one by one, and all the selected potatoes met Xiaotangshan's standards.

The association subsequently transported three trucks of potatoes to Xiaotangshan and the acceptance rate of the potatoes of these three trucks

reached more than 90%. Through cooperation with Xiaotangshan, the association has learned to prioritize the quality of its agri-foods. The association has also found that although the acceptance rate of the potatoes selected for Xiaotangshan is 100%, some of the potatoes can also be spoilt during the transportation. Therefore, the association plans to improve the packing boxes for potatoes next year in order to reduce this risk. CIDA also sent technical specialists to provide guidance to the association. The specialists suggested that a new potato growing method should be adopted, namely, the high ridge sowing method. The injury of potatoes can be avoided through the use of mechanical tools during harvest.

Xiaotangshan demands high food safety standards. For instance (1) the application of highly toxic pesticides should be strictly prohibited. Xiaotangshan provides a manual on safe pesticides to the association and only the pesticides listed in the manual can be used, (2) only the virus-free seed potatoes can be used in growing potatoes, (3) the quantity of fertilizer should be reduced. The association accordingly guides farmer households.
The association guides production according to the Xiaotangshan's requirements and purchases qualified potatoes from the growers. The purchasing price of potato paid by the association is higher than the market price. The small potato farmers are willing to work under the supervision of the association. The association plans to cooperate with Xiaotangshan the next year. The association also plans to sell potatoes directly to Carrefour supermarket because the purchasing price paid by Carrefour is much higher than that paid by Xiaotangshan. Xiaotangshan accompanied the person in charge of the Carrefour quality line on his visit to the potato growing base areas of the association in June 2007. If the potato growing base areas can pass the tests designed by Carrefour, the potatoes produced by the association may become one of the agri-foods on the Carrefour quality line.

Case 7: Linkages through wholesale markets - Tianyang Agricultural product Wholesale Market, Tiangyang, Guanxi

Guangxi Tianyang agricultural products wholesale market (Tianyang wholesale market) is the largest origin agricultural products wholesale market in southwest China. It has become the main form of local economic organization and promotes local economic growth and social development. Cooperating with other agricultural associations, Tianyang wholesale market has linked household farmers to the market, and serves as a great example of the "farmers + market" model of agricultural economic organization. Farmers or wholesalers bring their products (mainly vegetables or fruit) to the market. Then the local traders collect those vegetables and fruit; perform the picking, sorting and packing. Finally the traders ship the products.

Via the "market +brokers (associations) + farmers" mode, Tianyang wholesale market combined 83,000 families, 250,000 fruit and vegetable producers (83% of Agricultural population) together and established a large-scale production and market-oriented management structure. Standardized cultivation techniques have been further promoted, too. On the one hand, the number of local autumn and winter vegetable varieties expanded from 2

varieties initially, to over 30 famous varieties, including ruby tomatoes, green onions etc. On the other hand, the scale of production also expanded rapidly. Vegetable growing acreage increased from 4700 mu (1989) to 350,000 mu (2007), including a pollution-free vegetable growing area of 300,000 mu. Fruit acreage rose to 335,000 mu in 2007, with a total output of 81,000 tons. Mango acreage developed from less than 500 mu in 1981 to 135,000 mu in 2007, with an annual output of 38,000 tons.

Before the completion of Tianyang wholesale market, some growers had to cut down fruit trees due to poor mango sales. The establishment of the open wholesale market not only guarantees the timely sale of agricultural products, but also helps farmers to obtain reasonable prices for their produce. Agricultural product sales have boosted farmer incomes. In Heguxiang village, fruit and vegetable sales comprise 80% of farmer incomes. Selling fruits and vegetables to the wholesale market became the main means by which to increase farmer incomes.

A long history of relying on traditional agriculture Tianyang farmers' creates an ideological shackle for farmers and discourages them from developing and progressing. Tianyang market helps promote farmers' commodity awareness, market awareness, innovation awareness and awareness of science and technology, which enables them to improve their quality, and transform into modern farmers who can compete in the commodity economy. The market broadens farmers' horizons, and integrates them into the market economy. Farmers' mentality has changed from "make me plant" to "I want to plant". The wholesale market stimulated the farmers' enthusiasm for planting value added crops or fruits.

Case 8: Linkages through "parks" - Dairy Parks in Horinger, IMAR

This is a case drawn from a report by Chen, HU, and HU (2007). Dairy is the most important agricultural industry at Horinger, IMAR. About 22% of total agricultural labour in Horinger is engaged in dairy raising activities. In 2006, there are about 130,000 cows and 36,000 dairy farmers in the county. Mengniu established a joint venture large-scale dairy farm with 10,000 cows in 2005. The average size is very small with a typical dairy farmer household raising 3 cows. Concerned with the pitfalls associated with scattered small-scale dairy operation, a dairy park concept has been advanced as a development strategy by the local government and dairy companies to increase the dairy operational scale. A typical dairy park is built on a lot that can accommodate about 500 cows with about 20 small farmers. Individual farmers could either rent or buy the stalls in the park. The county now has 6 dairy parks that can accommodate about 3,100 dairy cows in 2006, accounting for about 3% of the total cow population in the county. Several perceived benefits of dairy parks are: 1) permit better planning and location of dairy operation; 2) separate cows from farmers' living quarters to improve living condition; 3) permit a unified way to deal with disease prevention and treatment, to centralize machinery milking, and to facilitate record keeping and traceability. These benefits presumably will translate into improved milk quality and better income for small farmers. For example, the local

government claims that, on average, the net income for the farmers from dairy parks is 500 Yuan per cow per year higher than those from villages.

Local government has a new policy to promote the development of dairy parks this year. For a park with a capacity over 500 cows, city and county governments provide a lump sum subsidy of 200,000 RMB to match 200,000 contributions from the dairy processor. The processor will also provide an interest free loan of 1 million to the park investor with a 10-year payback term. To encourage scale dairy operations through the dairy park concept, Mengniu also provides better fees for milk collection at 0.27 Yuan per kg, which is .05 Yuan over the fee paid to the regular milk collection stations. The milk price from the dairy park also receives a higher price at 1.9 Yuan, which is 0.06 Yuan over the price paid for the milk from individual farmers. It is anticipated that 14 parks will be under construction this year with this new supporting measure.

Some parks are built by the government, while others are built by the processors or private investors. Several operational models of dairy parks are observed. Stalls in the parks can be leased to farmers or sold to farmers. Farmers typically raise between 15-50 cows under some sort of collective action such as common feeding, common disease control and centralized milking. Alternatively, farmers can have their cows cared for by managers of the dairy parks and receive a net income per cow according to agreed terms. For example, IMAR Jia Niu Dairy invested 20 million Yuan to build a dairy park and individual farmers are encouraged to send their cows to the park. The park management looks after the cows and pays a fixed return to the farmers. As such, some name parks of that nature “Cow Nurseries”.

The scaling up of the dairy park model has achieved limited success in the Eastern and Northern parts of China, and has been slower in the Southwest. One of the reasons is that farmers are dispersed on hilly terrain, which makes it less economical for them to commute to the dairy parks. For example, New Hope Dairy in Sichuan is examining the incentive structure of the dairy park to see how this problem can be overcome.

Case 9: Farmer to agri-food processors - the Nestle Model in Heilongjiang

This case is drawn from a paper by Chen, Hu, and Hu (2007). Nestle in China has developed a quality assurance system in which most of its milk is supplied by small scattered family farming and hand-milking in Shang Cheng, Heilongjiang. Nestle’s intervention starts at the gate of the milk collection center, bulk milk delivered from individual farmer households is sampled and physically checked, which includes density testing to avoid counterfeits at the milk collection center, more comprehensive lab testing will be done in the factory afterwards, and the testing results and price matrix will be published on the wall of the milk collection center in the next few days. During the course of fifteen years, Nestle and local authorities have put forth tremendous efforts and are dedicated to building up a small farmer-based supply chain by training, management innovation, on-site technical service, cruise inspection,

as well as a traceable and transparent raw milk testing, grading, pricing and payment system. There are a total of 74 milk collection sites and 28,000 active dairy farmers in Shuang Cheng County with contracts with Nestle. The area of Shuang Cheng is about 3,112 square kilometers and there are 246 villages with an agricultural population of 600,000 (75% of total population). It is interesting to observe that, although farmers are permitted to sell milk outside the county, no competitors are allowed to set up milk collection stations in the county according to the agreement between the local county government and Nestle. The commitment of farmers to Nestle is high due to the opportunity for long-term collaboration and the good reputation of Nestle.

The majority of on-farm milk production is from small holders with 5~7 cows per household, 3 of which, on average, are milking cows. Most farmers milk by hand, except several large dairy farms with thousands of herds. The average yield of milk is 4.5 tons per cow per year, while the highest reaches 8 tons. The average daily collection of raw milk by Nestle was 1258 tons in 2005, 3.4 times that of 1997. Every year at least 3~4 thousand new farmers start their family business in milk production in the Shuang Cheng area. Nestle is not involved in bank loans for farmers, but the local government is. Farmers invest in dairy operations by themselves and are recouped after about 3 years.

A few management highlights of Nestle as a supply chain manager are observed. First, Dairy cows and barns look clean as farmers appear to be motivated to follow the instruction of Nestle in terms of good farming practices. Farmers are requested to keep production records. Nestle has its own inspectors cruising in the villages and milk stations. Second, Nestle owns about half of the 74 milk collection stations in an area of 3000 square kilometers. Farmers milk the cows at home twice a day and send the milk to collection stations by bike or motorcycle. All farmers are well trained and familiar with all the procedures of milk collection. The small milk containers, with a capacity of about 25 liters, are designed by Nestle but paid for by farmers. The management and maintenance fees of the manager or owner of the milk collection station is paid by Nestle. The station owner or manager can also get incentive pay for good milk quality or supplying more milk than assigned. The typical milk station has milk containment and hygiene facilities; the milk must be delivered to the factory within 3 hours of the milking. In the hot summer, some milk stations have cooling facilities as well (paid for by Nestle). The milk station is also seen as a place for information and education; for example, posters and VCDs are always made available to the farmers when they come to deliver the milk. Third, milk is transported in a sealed tank car. There are in total, about 50 tank cars. Nestle owns the tanks but private units or drivers own the cars. Nestle has inspectors cruising the process of transportation. Seals have to be kept intact when the tank cars arrive in the Nestle factory.

Fourth, Nestle has established its own quality standards based on international and national standards. At the factory, the HACCP program is in place but not certified by the third party as yet. It is the same situation at the

farm level, milk quality standards and dairy SOPs are in place but not certified by a third party. Fifth, farmers are paid for milk by Nestle directly through the post office network on a monthly basis. The milk price formula is comprehensive and dynamic; the pricing matrix generates hundreds of different prices based on quality and safety criteria. The major indicators of milk quality include total solid, fat content, inhibitor, freshness, and microbiological data. For example, the price for milk samples with the same fat content, e.g. 3.2%, but different colony forming unit (CFU), could range from 1 to 1.64 RMB/kg. Nestle also adjusts raw milk prices when necessary, based on a monthly investigation of the feed costs, the gross income of dairy farmers, and the price offered by competitors. Sixth, each individual farmer's milk is sampled and tested for density, icing point and freshness at the milk station every day. All samples of an individual station's milk have to be completely tested on all the quality indicators every day. If abnormal results of certain station's milk are present, a series of tracing-back experiments will be initiated until the problem-causing farmer's milk is identified. The milk of individual farmers is randomly selected for complete testing and it is guaranteed that each farmer's milk should be completely tested 5~6 times per month. Payment to the farmers is based on the quantity of and the average quality of the milk in that month. The lab also keeps the quality records of individual farmers, which helps detect adulteration if the raw milk quality fluctuates significantly within a short period of time. Adulteration is punished with a penalty price, or rejected if it is suspected to cause a food safety hazard. The testing results from Nestle Lab are posted on the wall of the milk station half a day later and mailed to farmers together with the pay sheet.

Seventh, due to a conflict of interest, Nestle staff and milk collection stations are not allowed to get involved in the feed business. Farmers have complete freedom in determining their feed suppliers. Nestle only provides information on nutrition requirements and feed resources to the farmers. Eighth, there are 6 specialized trainers in the raw milk management unit of Nestle who provide routine training to dairy farmers. Activities include: Nestle keeps bringing 30-35 farmers from villages to visit the factory and lab every day, half a day is for facility visiting and half a day is for trainings/workshops on certain topics in the Nestle pilot farm. Hoof trimming services have been commercialized; some local extension people trained by Nestle provide hoof trimming service and make reasonably good money. A herd health program is mainly managed by the local government; Nestle provides training and TA to animal husbandry & vet staff. Nestle provides an ongoing training program to farmers on a rotating basis; the training style includes both an in-door presentation and an on-site visit. Around 200 dairy households learned to produce and use bio-gas, which has initiated the environmental farming plan.

A few lessons are learnt from the Nestle case in China. Processors can play a critical role in linking small farmers with a premium based market. With the right pricing system, the on-farm quality assurance program can also work for small farmers. The incentive system requires a reasonable price matrix and must be consistent, transparent and fair. It is clear that success requires commitments from farmers, processors, and the government. Onsite training

and visits are crucial. The government still plays an important role in the supply chain in terms of policy, regulation and fair business competition. A win-win result will make the supply chain healthy and sustainable.

Case 10: Linkage through shareholding cooperatives – Shanglin Village Land Shareholding Cooperative

Jiangsu Shanglin administrative village has 14 natural villages. In the end of 2006, there were 2,700 laborers and 4,025 people. More than 90% of its laborers were employed in the secondary and tertiary industries with a per capita net income of 9,000 yuan. Shanglin is a typical agricultural village, mainly growing traditional grain and oil crops, vegetables, and fresh water fishery.

In early 2006, 117 farmers from three teams of Shanglin village and also the former collective economic cooperative formed "Shanglin Land Shareholding Cooperative" with 16 hm2 (240 mu) of land as equity. The cooperative was renamed "Shanglin land shareholding agriculture professional cooperative" in 2008. One mu was valued as one share with a price of 5000 yuan per share, for a total of 240 shares, making the registered capital of the cooperative 120 million yuan. The first year dividend was 144,000 yuan. Later, many farmers in the village saw the benefit and joined the cooperative. Currently, 1132 households participate in the cooperative with shares of a land area of 206 hm2 and a registered capital of 15.47 million yuan. The total revenue is more than 3 million, which is used for the dividend up to 190 million yuan. The minimum dividend per mu was also increased from the initial 600 yuan to 660 yuan.

The operating characteristics of Shanglin cooperative can be summarized below (Figure 4):

1) Construction of the structure of property rights between the three branches of power (collective, cooperative and farmer). Collective land ownership has remained unchanged. Farmers retain ownership of the land contract rights but have to give up the right to operate land contracts. The cooperative acts as the holder of land management rights. The cooperative leases land to large farmers through bidding or renting. The latter obtains direct land use rights and pays rent to the land shareholding cooperative. In accordance with the provisions and requirements of the Articles of Association, the land shareholding cooperative is operated under the General Assembly, the Board of Directors, the Board of Supervisors and other organizations, to play a different role in the cooperative.

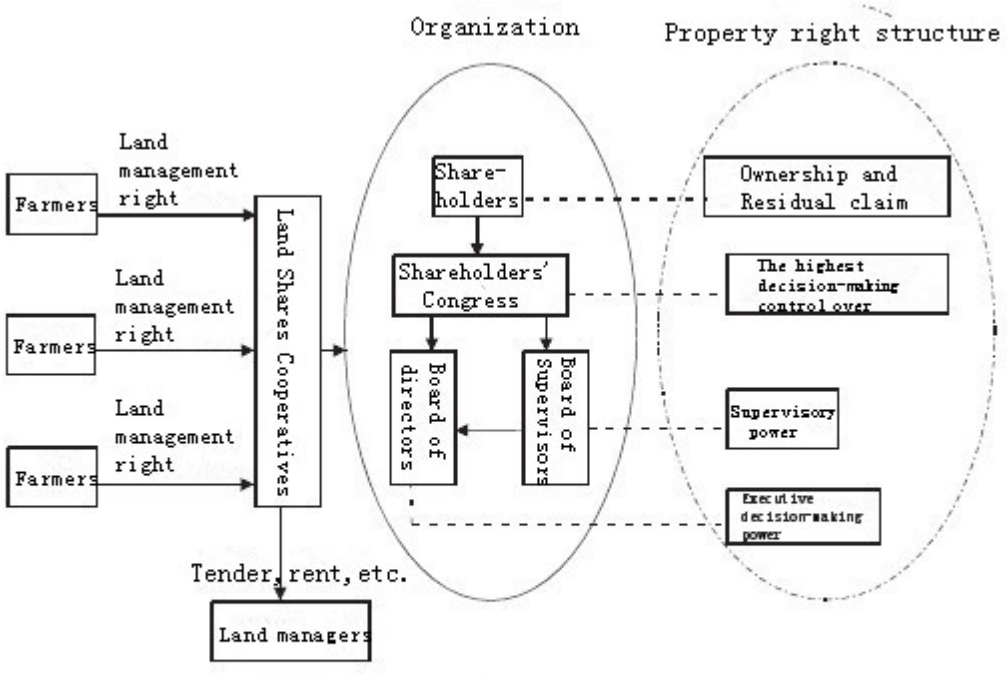
2) Option settings include two kinds of shares - collective and individual. The Shanglin land shareholding cooperative comprised of 117 individual shareholders of 117 farmers and 1 collective shareholder of the village economic cooperative. Land was converted into shares in a manner upon which the farmers themselves agreed. In principle, with reference to the average land value in the first three years and the remaining time of the land contract, it was ultimately determined that 1 hm2 land be priced at 75,000

yuan. With a total shareholding land of 16 hm2, the total value was 1.2 million yuan. The cooperatives' equity consists of farmer land shares at 15.31 hm2 with 1.1484 million yuan, accounting for 95.7% of the cooperative's subscribed registered capital and the village economic cooperative's share at 0.69 hm2 with 51,600 yuan, accounting for 4.3% of the subscribed registered capital. The collective is the largest shareholder of the cooperative.

3) Governance. Learning from the experiences and practices of other cooperatives, the Shanglin landholding cooperative established the General Assembly, the Board of Directors, and the Board of Supervisors, in which the General Assembly is the highest authority of the cooperative. It adopts one man, one vote in the elections and voting system. The current village leaders cannot serve as chair for the Board of Directors. The village leaders, as the village economic cooperative's shareholder, serve as the cooperative's ordinary supervisors.

4) Profit sharing mechanism. The basic principles are that, year-end after-tax profits are allocated in order to cover the losses, the statutory reserve and the Community Chest, and then the payment of dividends. There are minimum and floating dividends. Shareholders, in addition to receiving an annual minimum 600 yuan per share, can participate in the floating dividend.

Figure 4 Relations and Governance of Shangling Land Shareholding Cooperative, Jiangsu



Relationship between main body of property right and its corresponding rights in Shanglin village's rural land stock-cooperative

Case 11: Linkage through land shareholding companies – Dalian Xiangyin Agricultural Development Co., Ltd.in Liaonin

Chengxi village, Jinzhou district, Dalian city is a traditional agricultural area in the suburbs of Dalian. Since 2001 it has actively explored ways to use farmers' land as equity to form an agribusiness company. Collective land, capital, agricultural facilities, and the farmers' land are incorporated as business investments and together form Dalian Xiangyin Agricultural Development Co., Ltd. First, the land use rights were converted and quantified as options, with shareholding replacing the land use rights of the farmers. Second, the company's organizational structure was established, including the general assembly, the Board of Directors and the Board of Supervisors. Third, the new mode of operation with a market-oriented and scale-based approach was adopted, either under the unified management of the company, or contracted to farmers with a priority to shareholding farmers. Fourth, a benefit sharing mechanism with assured minimum dividends and equity dividends for shareholding farmers, as well as the contractor's operating income and wage income of workers were clarified.

The key for such a new entity is to ensure the mutual benefit of all partners, particularly small farmers. As shareholders of the enterprises, the farmers can earn dividends. Being freed from a scattered small-scale land operation, the farmer can go to work, do business, run transport or engage in servicing. Shareholding farmers can take contracts from the enterprise or participate as workers.

A number of policies are adopted to ensure the benefit of small farmers. First, shareholding farmers continue to receive subsidy payments from the government. Second, as land provides basic livelihood security for the farmers, the company provides a guaranteed minimum dividend at the beginning of the year, equivalent to obtaining a stable land rent. Third, if the company is making profits at the year's end, farmers can once again participate in the equity dividends. According to the company law: 60% of corporate profits after taxes is retained for the expanded reproduction and 40% for the capital stock dividends. In the event of loss, the risk will be spread according to the shares. Fourth, the company adopted a flexible management system that allows shareholding farmers to enjoy priority consideration for contracting. Upon receipt of the contract payment, the company supplies common agricultural inputs, provides common operational guidance, and conducts common collection and sale. The proceeds from sales are shared 50-50 or 40-60 between the company and the contracting farmer. There are more than 60 contracting farmers in 2012 and their annual net incomes ranged from 30,000 to 60,000. Fifth, the company gives priority to employing shareholding farmers. In 2008, there were more than 600 farmers working year-round in the company. The annual wages ranged from 10,000 to 30,000 yuan.

After the land shareholding, the farmers began to concentrate on operating the courtyard economy, particularly the development of livestock raising. In recent years, the village has grown to encompass 102 hen farmers and 0.8

million hens. The per capita income of the farmers continued to substantially increase in 2008 and reached 14,000 per capita, which was eight times more than in 1998 and 43% more than the average annual income of Dalian farmers, and three times more than the national average.

Case 12: Linkage through institutions – direct linkage between farmers and universities in Hubei

Hubei University has more than 20,000 people with 40,000 students and faculty dining on its premises year-round. The university has 6 student cafeterias with significant food demand. In December 7, 2012, Yunmeng county supply and marketing cooperatives in the Temple vegetable growing professional cooperatives and Hubei Engineering University in Xiaogan City, signed a "Farmer-to-School" agreement. The agreement requires Yunmeng to supply 1.7 million kilograms of vegetables, 1 million kilograms of rice, 0.4 million kilograms of noodles, 0.18 million of eggs, 0.05 million kg of live chickens and 0.14 million kg of fresh fish. This is one of the very first cases of “farmer-to-school” linkage in the country.

Case 13: Linkage through fast food chain – Xiabu Xiabu Co, Ltd, Beijing

Xiabu Xiabu is from Taiwan, founded in 1998 and headquartered in Daxing, Beijing. It is the first and largest "desktop" hot pot chain catering enterprise. Xiabu Xiabu has signed long-term supply agreements with a number of vegetable cooperatives in Beijing and Hebei. It receives more than 40 tons of vegetables and other agricultural products from the cooperatives on a daily basis.

After years of development, Xiabu Xiabu has established cold chain logistics and distribution centers in collaboration with agricultural cooperatives. Before noon the day before, the restaurant store orders from the logistics and distribution center through the system, these orders are then sent directly to the base; where, that very same afternoon, picking and sorting are carried out, and at midnight that evening the vegetables are transported to the point before 8:00 p.m. Vegetables are distributed from the field to the restaurant outlets within 24 hours.

First, this model helps farmers and cooperatives develop stable agricultural marketing channels to stimulate farmer incomes. This is achieved through the deliberations of the order cultivation and the annual average price, which protect not only the purchase price, but also ensure a stable income for growers.

The second feature of this model is that it builds a harmonious relationship between supply and demand and benefit-sharing mechanisms. This is accomplished by building trust and cooperation through agricultural production bases and farmers, to ensure catering enterprises procurement supply and price stability; while at the same time, ensuring that farmers get an assured price, and that interest in and the responsibility of ensuring the quality

of the long-term mechanism is shared. In addition, it also ensures that customers get to eat safe dishes.

Third, this model manages to allocate clean vegetables to restaurants and also reduces food waste along the chain.

Fourth, a protective measure is erected to protect food safety. Quality is assured via uninterrupted supervision through the agricultural food docking system from the origin to the table, which helps to promote Xiabu Xiabu's good image.

Xiabu Xiabu actively participated in Beijing Municipal Commission of Commerce and expanded its publicity and economic benefits. In October 2011, when Inner Mongolia had an unmarketable potato problem, Xiabu Xiabu responded to the call of the Beijing Municipal Commission of Commerce, and purchased the first 100 ton batch of potato from Wulanchab. Xiabu Xiabu did not spend a lot of money on advertising but achieved disproportionate economic and social benefits.

Case 14: Linkage through Supermarkets – Carrefour's Direct Purchase Program

In 1995, Carrefour became the first foreign supermarket to enter China as a joint venture. At the end of 2012, Carrefour opened 218 hypermarkets in China. Carrefour launched the "Direct Purchase" president project and began to procure agricultural products directly from farmer cooperatives. In support of the Department of Economic Management of MOA, Carrefour's direct purchase project has made smooth and steady progress. Cooperatives that contract with Carrefour had 50 in 2008, expanded to more than 200 in 2009, more than 300 in 2010, and increased to 529 by the end of 2012. As of this year, Carrefour farmer-to-supermarket procurement involved 1,174,000 farmers, purchased 334,000 tons of agricultural products such as fruits and vegetables, amounting to ￥14.5 billion. Cooperatives that contract with Carrefour are located in most of the provinces in China.

The supervisor of the direct purchase project in Carrefour headquarter is the fresh food procurement president, who is in charge of management, guiding farmer-to-supermarket procurement, and formulating relevant policies. Subordinate to the president, the direct procurement director is responsible for the day-to-day procurement and distribution. Following the director, several negotiators collect the supply information of the cooperatives, and send orders to suppliers in accordance with the product demands of each City Commission Units (CCUs). Meanwhile, coordinators are the personnel dispatched by Carrefour headquarters. Their duties include guiding cooperatives in agricultural products' grading, packing, loading and delivery. In addition, coordinators are also responsible for finding new cooperatives and training them.

CCU is a new organizational structure created by Carrefour in recent years. In establishing the CCU, Carrefour relocated the procurement authority from the

store level to the city level. For example, Carrefour has more than 20 stores each in Beijing and Shanghai. The local CCU is responsible for the procurement of goods and commodity pricing. On the one hand, CCU is the purchaser. In fact, the direct procurement department in headquarters just performs information gathering, processing and provision. CCU is the real purchaser. On the other hand, CCU itself is also involved in the farmer-to-supermarket project. CCU purchased fresh foods that are not suitable for long-distance transport (e.g. leafy vegetables) directly from the neighboring farmer cooperatives.

There are two patterns of farmer-to-supermarket procurement in Carrefour. One pattern involves setting prices once a week. The other is called “annual break-even price.” The former involves suppliers or farmers' cooperatives that sign trading contracts sending the details of products that they are able to sell to Carrefour headquarters negotiators via fax, email or mobile message. Upon receiving the information, negotiators will gather, sort out and send them along to CCU. CCU then receives the information, counts and gathers the demand in every branch supermarket and gives the orders to farmers' cooperatives through the headquarter negotiation department. Next, the cooperatives will deliver the products. The latter pattern takes place at the beginning of every year, at which time Carrefour headquarters will negotiate with the cooperatives. Cooperatives set fixed prices for the products and Carrefour will offer annual order plans according to the price. When necessary, Carrefour will give advance payments of a certain proportion to help cooperatives maintain stocks. Now, dried fruit or nuts like raisins will follow this pattern and rice will also follow the latter pattern.

In the pattern that involves setting prices once a week, after taking the order, the cooperatives will prepare goods for delivery according to the order, which means that they will take the produce out from cold storage (or normal temperature storage); and then classify and encase the produce according to the Carrefour ID in the processing workshop. The Carrefour coordinator will check whether the qualification and specification of the encased produce matches the order. Then, cooperatives will consign produce delivery to third-party logistics companies, after which, the receiving clerk in every Carrefour distribution center in different cities will examine the produce. Then, cooperatives will make out the invoices for Carrefour according to the receipt. As soon as invoices have been sent to the headquarters, Carrefour will pay cooperatives through the bank, i.e. via immediate payment.

Case 15: Farmer through exporter – Emerging Sino-Japan Vegetable Value Chains

This case is drawn from Chen, Chen, and Shi (2004). Because of the continuously expanding demand for vegetables on the domestic and international markets, vegetables represent one of the fastest growing sectors in Chinese agriculture. The most recent trend is that an increasing proportion of Chinese vegetable exports to Japan has been produced under tightly coordinated value chains. One of the possible reasons is that Japan has one of the strictest sets of standards in the world. These standards mainly relate

to appearance, size and packaging. Typically about 20% of garlic and 30% of welsh leek produced in Shandong meet the Japanese standards. Vegetable exports to Japan must be in accordance with the labeling system of the JAS Law including barcode and the place of origin. Moreover, shipping vegetables to Japan requires the use of a dry container or an air-controlling container. It is mandatory to chill the vegetables in the facility before transporting them. Containers used are based on the variety of vegetables. For example, garlic can be packed in a sack, put into cartons and transported in a dry container, while broccoli must be chilled and iced before being put into a reefer-container.

To gain some insights into these cross-border production and marketing arrangements, several cases from Shandong were chosen. Shandong started to export fresh vegetables to Japan in the mid 1980s and processed vegetables towards the end of the 1980s. The vegetables produced for Japan were initially concentrated in the Eastern coastal peninsula region around Qingdao and Laiyang, then expanded to the middle region around Weifang and Linyi, and finally to the Western region around Jinan, Taian and Jinxiang. Shandong now is the largest vegetable producing and exporting province in China. As vegetable production is largely carried out by many small farmers, how the vegetable industry performs could affect the livelihood of small farmers significantly.

Because the vegetable industries across Shandong's different regions are at different stages of development and produce different vegetables, many different types of vegetable value chain organizations can be identified. Depending on the degree and type of vertical coordination, seven cases of Sino-Japan chains are observed in Shandong.

Sub-case #1: Jinxiang prefecture is a traditional vegetable-producing region in the Southwest of Shandong. Its total cultivated arable land is 54.6 thousand hectares and 70 percent of the total land is for planting vegetables. The total annual garlic production is more than 600 thousand tons in Jinxiang and a certain proportion of it is exported to Japan. Hongchang, a local joint stock company, used to source its garlic in the open market. One of the Japanese requirements is that garlic's diameter must be over 6.5 centimeters. On average, about 20% of Jinxiang's garlic is able to meet such requirements. Since 2000, while continuing to source its garlic from the open market, Hongchang has also begun to sign contracts with farmers to produce organic garlic. The contract prohibits the farmers from planting cotton or other crops which require agricultural chemicals to control pest problems and only permits the farmers to plant wheat and white gourd.

Sub-case #2: In 2000, Japanese importer Nichu Trade Co., Ltd (Nichu) established a subsidiary – Yinglong Food Co., Ltd (Yinglong) in Jinan (the capital of Shandong province). Yinglong had built a large number of onion "producing bases'' with the surrounding farmers. In 2002, the total area of these onion "producing bases" reached 67 hectares. Yinglong provides onion seeds (named Yinglong No.1 and Yinglong No.3), fertilizer, as well as planting technology to farmers. The inputs and technology are typically priced higher

than the market price. In return, the company promises to buy back onion from the farmers at prices that are sufficiently higher than those offered by the free market. In 2002, the contract price was 0.8 Yuan per kilogram, which is much higher than Shandong's Liaocheng wholesale price of 0.55 yuan per kilogram. The rationale for doing this is to prevent the farmers from selling their onion to other merchandisers. Fresh peeled onion is transported to Japan by reefer container and Nichu delivers directly to the restaurants. Alternatively, fresh onion with peel is transported to Japan by dry container and then transferred to either supermarkets or wholesale markets.

Sub-case #3: In 2000, areas allocated to vegetable production reached 19,600 hectares in Zhangqiu, and 35% of this was planted with welsh leek. Total welsh leek production reached 416 thousand tons. Moreover, its mushroom houses are 400 thousand m^2 in size. Zhangqiu Agristar Canned Food Co., Ltd. (Agristar) is a manufacturer of processed foods with an annual processing capacity of 6,000 tons of vegetables. The company's total assets amount to 20 million yuan. With its first-rate production line, the company produces canned mushroom, canned asparagus, canned peach, canned grape, canned fruit mix and bagged mushroom. These products have been exported to Japan, South Korea, South-East Asia and some European countries. The company adheres to a strict quality control practice and obtained ISO 9001:2000 Certification in 2001. Efforts are also being made to achieve Federal Drug Administration (FDA) Certification in order to export the products to the United States. Agristar has built strategic alliances with both the Zhangqiu government and a Japanese buyer. In order to promote the regional development of the vegetable industry and improve the farmers' income, the Zhanqiu government granted 1 million *yuan* for the construction of a mushroom plant housing facility. Nisho Iwai of Japan sends technical experts to Agristar to ensure that its products adhere to Japan's safety and quality standards. Agristar also enters contractual relationships with farmers with orders from Nisho Iwai. The minimum price is 3 yuan per kilogram. Its canned mushroom is imported into Japan by Nisho Iwai and then sold to supermarket chains and food service industries.

Sub-case #4: Tanan city is a traditional production region for ginger and other vegetables. Taian Asia Food Company, established in 1992, is a joint venture with Hong Kong Nanhai Co., Ltd. It produces mostly frozen and fresh vegetables. It is the first company in China to export organic vegetables to Japan. An integral organic ecology system was introduced in 1993. The system includes one cold store with a capacity of 7,500 tons, four factories each equipped with an advanced assembly line, one organic pig farm, one comprehensive lab, 17 organic vegetable farms and one edible fungi farm. In 1999, the company obtained ISO9000 quality system certification as well as HACCP certification. It now has 333 hectares of total vegetable ''producing bases", and produces 10,000 tons of frozen vegetables per year, and 2,000 tons of fresh vegetables per year. Taian Asia does not sign contracts directly with farmers but through a village vegetable cooperative, which was formed by a village committee and the leading vegetable farmers in the village. The relationship between farmers, the village, and Taian Asia is rather complicated. For example, the facility of "protecting net'' used in vegetable

production is jointly funded by Taian Asia, the village and farmers. Taian Asia provides the fertilizer to farmers in advance and farmers pay for fertilizer when they sell their vegetables to Taian. Taian Asia also sends its technical persons to provide plant technology advice. Taian Asia has built a strategic relationship with Nichirei Co., Ltd (Nichirei) in Japan to sell its vegetables in Japan. About 70 percent of its frozen vegetables was sold to Japan through Nichirei.

Sub-case #5: Anqiu City is a traditional garlic- and ginger- producing region. The main export vegetable of Anqiu Donghe Foods Co., Ltd (Donghe) is welsh leek. Its welsh leek exports reached 5,000 tons in 2002. Donghe has also built 67 hectares of vegetable ‘’producing bases” and has signed a contract with a village committee that dictates that the individual farmers of the village must specify the number of acres. The contract has to be signed every three-months as different welsh leek varieties are used for different seasons. Since 2002, it has also started to rent land from small farmers in order to achieve scale economies and to better ensure safety and quality. Donghe produces welsh leek according to the quality, labeling, package and safety standards of Marusoku Co., Ltd. Marusoku’s specification is from Aeon Co., Ltd., which is a supermarket chain in Japan.

Sub-case #6: Laiyang city is a leading exporting region of vegetables to Japan in Shandong. Taro is one of the main vegetables produced in Laiyang city. Longda Foodstuff Group Co., Ltd in Laiyang City is a leading company that exports taro to Japan. Interestingly, Longda has established six joint venture factories with different Japanese trading companies including Nusui Co., Ltd., Iwatani International Corporation, and ITOCHU Corporation. Longda purchases raw taros directly from farmers under contract for further processing. It also purchases semi-processed taro from a number of local small firms. The competition is fierce. It took over Laiyang Asia Food Co., Ltd in 2001 and became the leading frozen food company able to produce multiple products in Shandong.

Sub-case #7: Qingdao is traditionally a leading food exporting region in Shandong as it is an important port in China and has a long history of food processing. In 2000, Miho Japan Co., Ltd. Established a branch firm named Qingdao Lengfeng Foods Co., Ltd. It mainly produces frozen vegetables and other foods and does not sign contracts with farmers to plant vegetables. Rather, it rents land from small farmers in the surrounding region of Qingdao City and Shouguang City to form a larger scale operation to produce its own vegetables. The travel time between Lengfeng and these two cities is within two hours by truck.

The Japanese distributing system is a very complex one. Many companies in the distribution system are typically closely linked or vertically integrated. For example, Marusoku is linked with Aeon (the supermarket chain). Nichu is a group company of Fujisho Co. Ltd. Summit Toko is a group company of Sumitomo group. Nichirei is the large frozen foods company, which has the largest cold-chain logistic network in Japan. It is very difficult for foreign suppliers to link directly with a retailer or a wholesaler in Japan. When the

Chinese vegetables reach Japan, they go either to wholesalers or to supermarkets or to the catering service sector. However, compared with Japanese vegetables, a larger proportion of the Chinese vegetables bypasses the wholesale markets. Between 1999 to 2001, on average, the proportion of Japanese vegetables going through wholesale markets was close to 80%, while less than 40% of Chinese vegetables went through the wholesale markets. The main reason is that the consumers in Japan have begun to increasingly purchase their vegetables in supermarkets. For example, the proportion of consumers who buy vegetables from supermarkets was only 10% in the mid-1960s but rose to 45% in 1990 and to 59% in 1999. To secure safe, cheaper and consistent supplies, more and more supermarkets in Japan have formed strategic alliances with the Japanese trading companies to source their vegetables directly from low labor cost countries such as China.

8.2.2 Appendix 2: List of Public Market Linkage Programs in China

Linkage Program 1: Wholesale market development and upgrading

Wholesale markets have been an important outlet for small producers in China since the 1980's. The most rapid development in the wholesale market was observed in the 1990s. Wholesale markets have been established in every major town and city in China. By 2009, there were more than 3,600 wholesale markets with an annual turnover of 1.4 trillion RMB (MOA 2011). Among these, there were 212 for grain and oilseed, 992 for vegetable, 390 for fruits, 320 for livestock, and 182 for aquatic products. There were 2, 631 wholesale markets in production regions and 975 urban wholesale markets. The urbanization and rapid diffusion of supermarkets started during the 1990s, however, has started to affect the functioning of wholesale markets. Upgrading traditional wholesale markets has become a key policy initiative for the government.

From 2003 to 2009, the National Development and Reform Commission (NDRC) invested 2 billion RMB to help establish an information system and agricultural product quality inspection system for 650 wholesale markets. Since 2005, the Ministry of Finance (MOF) has provided funds to support the development of an information platform, distribution center, and cold chain of the wholesale markets. The Ministry of Land initiated a new land policy to facilitate the consolidation of the wholesale markets by re-categorizing the use of land for wholesale markets. During the period of the 11th five year plan, the Ministry of Agriculture (MOA) provided upgrading support to 500 wholesale markets in the country. In June 2007, the MOA signed an agreement with the Agricultural Bank of China to provide 10 billion RMB to fund upgrading activities for wholesale markets.

The 2012 Number One Policy Document issued in January 2012 calls for continued support for the construction and upgrading of the wholesale markets. A number of key initiatives are: 1) to support the construction of a trading place, electronic trading, information systems, quality control; 2) to integrate the land use of the wholesale markets into the overall land planning; 3) to encourage innovative approaches through shareholding, rights transfer,

public matching etc. to construct non-proft wholesale markets; 4) to support investments by the Cooperative for the Agricultural Supply and Marketing (CASM), post logistic company, and large corporations in wholesaling, warehousing, and logistics; 5) eliminate the value-added tax for wholesaling; and 6) to reduce fees for wholesalers. In January 2012, the General Administration of Industry and Commerce (GAIC) released a policy document to encourage direct links between agribusiness or cooperatives with the wholesale markets to reduce the number of intermediaries. In September 2012, the MOF exempted wholesale market owners from paying property taxes. In December 2012, the Ministry of Commerce (MOFCOM) issued a policy document to support the introduction of auction systems in the wholesale market.

Linkage Program 2: Direct "farmer to supermarket" purchase program

Despite significant progress towards increasing farmer incomes and addressing poverty in China, a considerable fraction of the country's population remains plagued with low incomes, particularly when compared with the incomes and income growth of urban households. Rapid urbanization and rising per capita income is prompting consumers to demand a wider variety and higher quality of foods. Urban consumers in China are increasingly buying their food at supermarkets; the latter are quickly becoming major outlets for farm produce. However, small farmers in China face challenges in selling to modern markets as the latter increasingly require stricter food quality and safety standards. In 2007, the Chinese Ministry of Commerce initiated the "farmer-to-supermarket" (FTS) program to promote direct links between farmers and supermarkets and to improve farmers' ability to access modern markets.

Since then, the FTS has been an important element of China's agricultural and rural development strategy. It is an ambitious program and an innovative response to the chronic problem of low farmer incomes. Its innovations consist of the following: 1) it operates at scale – as a national program it operates in fifteen provinces of China. In 2010 it had a budget of approximately $2 billion; 2) it is a unique partnership among farmers, the government, and business entities; and, 3) it encourages market development in the localities in which it operates.

In furtherance of the program, the government provides subsidies and training as well as networking opportunities to the farmers. The program's goals are to raise and smooth farm incomes, and ensure, improve the safety of, and reduce the cost of the food supply to urban consumers. From 2007 to 2012, the number of provinces participating in the program rose from 7 to 15, and the budget for the program grew more than proportionately.

There is, however, a lack of evidence on the effectiveness of linking smallholders with supermarkets through such a public-private partnership program. The impacts of the program on farmers' incomes, food safety, and consumer prices are not well understood or documented. There is a need, for example, to apply a randomized trial to quantify the effects of a series of particular forms of private-public partnerships on farmers' income, safety of

food produced, and consumer prices. The results from such a proposed study will inform future policymaker efforts to redesign the program to enhance small farmers' links with modern markets.

Linkage Program 3: Promotion of Farmers' Cooperatives

Since 2002, there has been a big push to promote the development of farmer organizations such as through commodity associations and farmer cooperatives in China. In 2003, both the Ministry of Finance (MOF) and the Ministry of Agriculture (MOA) spent about 80 million RMB to support the development of farmers' cooperatives. The Farmer Cooperatives Law has been in effect since 2007 and clearly articulates the legal status of farmer cooperatives and their development specifications. Articles define the government's basic policy to support the development of cooperatives through financial support, tax incentives and support of financial, technology, talent, and industrial policy guidance and other measures.

There are a number of policy supports. First is industrial policy support. "Farmers Cooperatives Law" Article 49 stipulates that the state support the development of agriculture and the rural economy, and that construction projects can be commissioned and implemented through farmers' professional cooperatives. Farmer cooperatives as an emerging market entity are still weak. Industrial policy should allocate support to cooperatives as an important aspect of the implementation of a national system of agricultural support. Second is fiscal support. "Farmer Cooperatives Law Article 50 stipulates that the central and local governments should earmark funds to support farmer cooperatives through information, training, standards and certification of the quality of agricultural products, agricultural production and infrastructure construction, marketing and technology promotion services. Third is financial support. Farmer cooperatives Article 51 of the Act demands that the national policy related to financial institutions and commercial financial institutions should engage in a variety of forms of financial service provision to farmer cooperatives. Fourth are tax incentives. Farmer cooperatives can enjoy the preferential tax policies of the country's existing agricultural development support, as independent organizations. The farmer cooperatives provisions of Article 52 of the Act indicates that farmer cooperatives can benefit from the state's corresponding tax policies that incentivize agricultural production, processing, distribution, service and other agriculture-related economic activity.

At the same time, the General Office of the State Council (2012) issued the 4th, the 10th, the 13th, the 22nd, 47th central documents to emphasize various supports for farmer cooperatives. "The Agricultural Modernization Funds Assistance Act Enforcement Decree" released by the MOA (2006) put forward a clear path for providing financial assistance to agricultural cooperatives. Issued in 2011, "China's Rural Poverty Alleviation and Development Act" urged to make full use of the cooperative-led poverty alleviation strategy. MOFCOM (2012) issued a "guide" on speeding up and strengthening cooperation with farmer cooperatives to enhance the marketing of agri-food products. China Banking Regulatory Commission also issued

policies to support development of farmer cooperatives and other agribusiness professionals. The MOF (2008) temporarily exempted cooperatives from income tax in 1994 and formally exempted them from a variety of value-added and stamp taxes. Zhejiang, Jiangxi, Sichuan and other local governmental departments under the guidance of the central policy, issued guides on varying types of support for the development of cooperatives through tax cuts.

Linkage Program 4: China's "Dragon Head Enterprise" Policy Framework

In 1995, People's Daily published an editorial on agro-industrialization policy, discussing the market as a base, dragonhead companies as carriers, and agro-industrialization as a means of promoting agricultural and rural development in China. The central, provincial, and local governments have announced a number of measures to promote agro-industrialization. The Office of Agro-Industrialization was established to promote a co-ordinated system and a so-called dragonhead company policy framework. The Office is stationed in the Ministry of Agriculture and coordinates with nine ministries.

The main objective of the policy initiative is to promote the linkage between small farmers and larger markets. It now has 500 national level dragonhead companies selected on the basis of many criteria. One of the key criteria is its capacity to link small farmers with larger markets and to increase farmers' income. The selected national dragonhead companies receive a number of subsidies from the government, including funds to be used on production bases, seeds, and breeds; favorable tax treatments such as 3% reduction on value-added tax; and favorable credit treatments. Provincial governments choose their own provincial level dragonhead companies, while local governments choose their own local level dragonhead companies. Additional benefits such as a reduction of the land price and in terms of local taxes, favourable treatment is always extended. It is up to local governments to decide what measures they see fit to undertake. As a result, rich provinces or cities or counties are able to provide more support to their dragonhead companies. There is fierce competition for obtaining a dragonhead company listing. In addition to monetary benefits, the listed companies also gain a good reputation among consumers and within the industry. Many companies see it as a significant tangible benefit to be credited as a dragonhead company.

Many different types of companies can be dragonhead companies such as processors, supermarkets (Lian Hua), wholesalers (Sha Guang), farmers' associations (None), cooperatives (None), distribution centers (not clear), etc. In recognizing the importance of changing the food distribution system, the next step is to list more distribution companies and farmer associations as dragonhead companies. There are in total, about 40,000 dragonhead companies in China. For the national level dragonhead companies, there is an assessment system to measure the performance of the dragonhead companies. Those who fail to meet the performance criteria are de-listed. There were 151 companies that were evaluated for the first time in 2003, 4

were de-listed. An independent review of such a policy is much needed to understand its nature and outcomes.

Linkage Program 5: China's Push on Agri-food Industry and Technology Parks

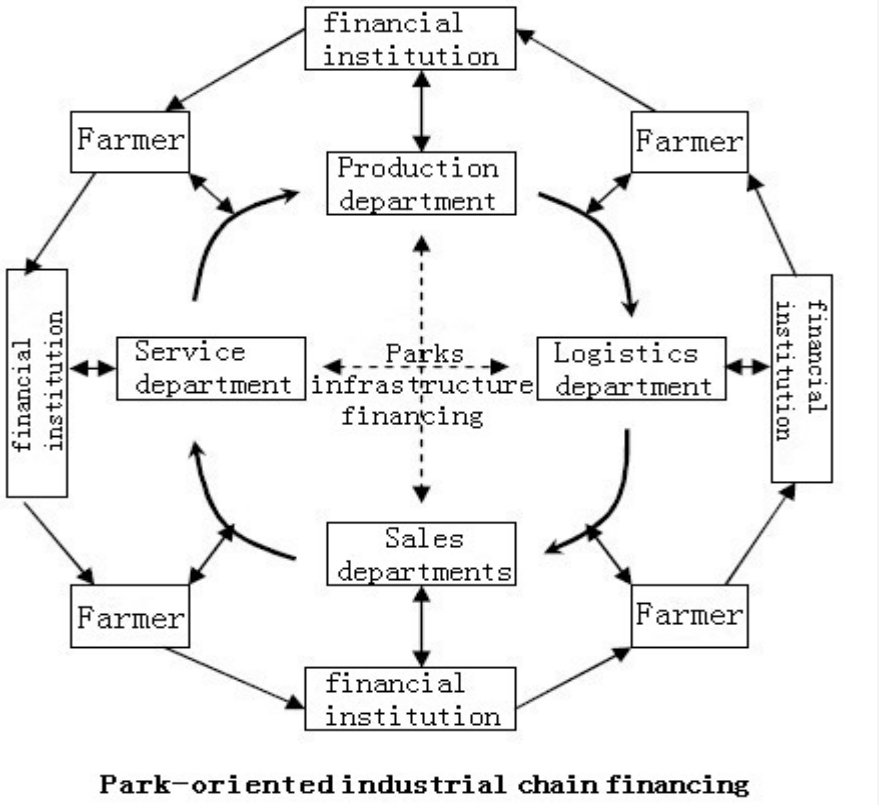
Park-led industrial chain financing, relying on vertical integration between suppliers, manufacturers, vendors, service, as well as professional associations and cooperatives, meets the financial needs of the agricultural industry stakeholders. The model relies on agricultural business entities within the industrial clusters and on the interdependence of information, resources, technology, and sale channels to ease the credit risk of agriculture and to improve the incomes of financial institutions. We use Rong Chang County Animal Science and Technology Park as a case to illustrate how Agricultural Bank Rong Chang Branch delivers park industry chain financing. Rong Chang County Park is the only livestock industrial park in the country. The park has more than 150 livestock production, processing and marketing enterprises, about 80 feed, veterinary drug and processing enterprises, and the Southwest region's largest livestock market. Rong Chang Campus, Southwest University, Chongqing Academy of Animal Husbandry and other research institutions are located here, with the scientific and technological talents of more than 1,300 people. The park has now linked with more than 158,000 farming households and over 50 farming cooperatives. It has formed an industry network focused on production, marketing, research, and service. The Rong Chang Animal Husbandry Science and Technology Park industrial chain financing includes three levels of financing, the park construction financing, "enterprise + corporate' financing, " and enterprise + farmers "financing, as shown in Figure 5.

First, the Bank, through cooperation with the county government, participates in the park's infrastructure financing, improves the park's financial facilities and expands the industry chain financing platform. For example, the Agricultural Bank provides a credit of 160 million yuan to build the Rong Chang livestock products market infrastructure and also signed an agreement to undertake financial services within the trading market, the clearing system, and other areas.

Secondly, through industry surveys and evaluations, the bank established the project library, strengthened the participation and supervision of industrial projects in the park, and mapped out the industrial chain. For example, the Agricultural Bank facilitated the Rong Chang and livestock park industry financial ecological mapping and designed a tracking system to follow the development of the industry chain.

Thirdly, through its cooperation with intermediaries (insurance companies, security companies), the bank integrates feed, breeding, slaughtering, processing enterprises in the park, using core value judgments, a customized counter-guarantee agreement, a default defuse program to develop financial services to realize "enterprise + corporate" financing.

Figure 5 Park-oriented Agri-food Industrial Chain Financing

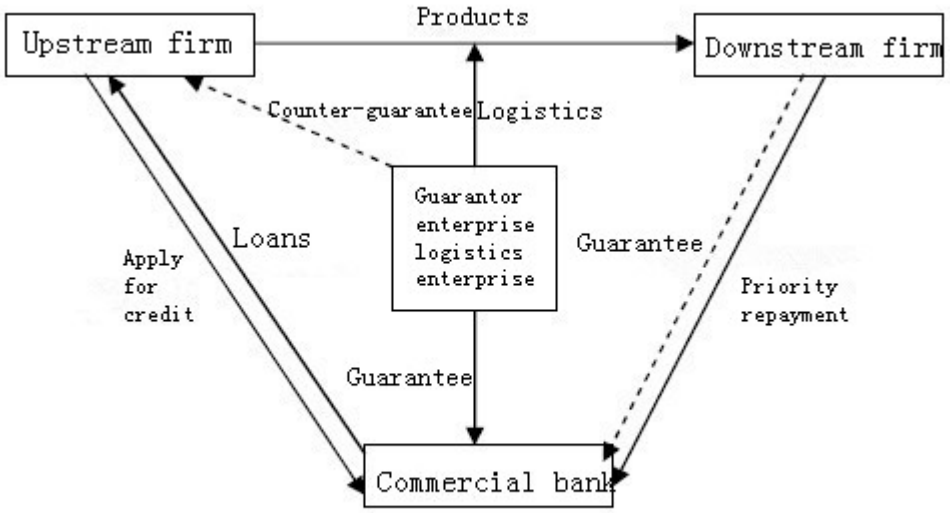


Finally, through verification of the scale of farming or processing, orders, and mortgage channels, the bank can adopt either ”fixed loan, repayment schedule” or "total ration, recycling loan" to implement centralized credit to farmers in the industrial chain in order to realize "enterprise + farmers' financing.” The set-up of risk funds is effective as pig insurance has played a great role in encouraging the banks to provide un-mortgaged loans to farmers. For example, one large pig raising farmer in Guangji village, Renyi town, Rongchang secured a loan of 100,000 yuan through a joint mortgage of five households. In 2010, it had pig sales amounting to 200,000 yuan. The net income was 50,000 to 60,000 yuan.

The "enterprise + corporate” financing is a core part of park-oriented industrial chain financing. Shown in Figure 6, the upstream industry chain of agricultural enterprises, in selling products that cannot be received in a timely manner, affects the purchase price of the upstream and downstream enterprises. In this case, the upstream firm can take advantage of the outstanding receivables due from financial institutions to handle financing business. With the bank as the borrower and upstream enterprises and downstream enterprises as the guarantor, the enterprise can take advantage of the guarantee company or logistics enterprise as a second source of repayment to reduce credit risk. The latter can be controlled through the logistics between the upstream and downstream enterprises or through proposed security measures, such as patents, trademarks, slaughtering licenses, order agreements, and/or mortgages, to influence corporate behavior. In financing enterprise problems, the bank not only prioritizes the upstream and

downstream enterprises' trade of receivables, but also the sharing of risk and guarantees with the circulation enterprises. Of course, the bank provides loans based on the assessment of the industry chain and downstream enterprises, and guarantee intermediary supervision can effectively reduce the credit risk of financing enterprises. This shows that the most important thing is that the "enterprise + enterprise" industrial chain financing of the operation of the interdependent relationship between the upstream and downstream enterprises is investigated, along with credit relations, as well as the whole industry chain.

Figure 6 Agri-food Industrial Chain Financing between Upstream and Downstream Firms



The industrial chain financing between upstream and downstream firms

Linkage Program 6: New Food Safety Law and Challenges Ahead in China

China's Sanlu milk powder incident occurred in 2008 and was an illustration of how inadequately China's food safety system protects consumers. It also sent a strong warning to all food manufacturers. The inadequacy of government food safety regulation was exposed bit by bit through this and many other foods safety incidents in China. Policy makers, donor organizations and scholars in China and abroad have been concerned with food safety issues in China. China's new food safety law was passed on February 28, 2009. The law came into effect on June 1, 2009.

Under the new law, government regulation and operator responsibility serve as the two cornerstones of ensuring food safety. The law seeks to clarify and streamline oversight between government agencies by giving the Ministry of Health (MoH) a greater coordinating role and establishing a National Food Safety Commission. MOH is now the sole agency responsible for information disclosure. Clearer definitions of responsibility between ministries and at the

county level have been established. This should result in a reduction of redundancy and miscommunication. Nevertheless, China's disjointed approach to food safety has not fundamentally changed. Under the new law, food safety is still regulated through disjointed stages of supply chains. More than seven Ministries are still involved in regulating food safety in China. In addition to the overall coordinating role of the MOH, different ministries are responsible for the food safety at different stages of the food chain. The Ministry of Agriculture (MOA) is responsible for regulating food safety at the primary production stage. The Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) is responsible for regulating food safety at the processing stage of food production as well as for imports/exports. SAIC is responsible for regulating food safety at the food marketing stage. The State Food and Drug Administration (SFDA) is now responsible for catering services and health foods. Though MIIT and MOFCOM are not directly tasked with ensuring food safety, they are involved in the administration of food industry.

At the same time, the new law stresses that operators should be primarily responsible for the safety of products under the market system. Civil means should be used to encourage responsible food production and operation. Operators should be responsible for their own civil liabilities. It is the first time that food operators are required by law to be primarily responsible for food safety. Financial penalties for offending enterprises are increased significantly. Offenders now face punitive sanctions up to ten times the value of products implicated.

The increased array of regulatory requirements and legal liabilities will likely increase the costs for enterprises. According to a small survey of 26 enterprises in August 2009 (Chen and Song 2010), 96% of enterprises have felt the impacts of China's new food safety law. 72% of enterprises surveyed indicate that their food safety responsibilities have been clarified after the adoption of the new food safety law. 64% reported an increase in the number, time and frequency of inspections. 68% reported the increased cost of inspections. 56% considered the related standards to have become stricter than before. 73% reported an increase in food recall. When asked about the difficulties on meeting food safety requirements, 88% of enterprises surveyed indicated that the costs of testing, buying equipment, and consultation were high. 65% of enterprises complained that there were too many standards with very little difference between the various standards.

The continuation of the status quo of the regulatory structure on food safety signals that there will continue to be huge challenges for China's current food safety regulatory system in the future. Food safety regulation that progresses through stages easily leads to redundant regulation and unclear responsibilities among governmental agencies. First, it compounds the costs and difficulties for authorities to regulate food safety. The government's responsibilities are daunting, as it faces the difficult task of coordinating every sector. The authority's financial input may be duplicated. Duplicated regulatory zones and regulatory blindness co-exist. Secondly, food

businesses' costs are artificially increased. A business needs to obtain multiple food safety licenses from various agencies. They are often supervised and inspected for the same food safety issues by different agencies. Thirdly, it is not convenient to protect consumer benefits. When a consumer buys problematic food, she or he does not know to which sector to complain. Each sector sets its own quality standards for the same food. This results in considerable confusion among the consumers.

Linkage Program 7: Government Sponsored Agri-food Distribution Centers

Zhejiang is one of the most developed provinces in China and is a neighbor province of Shanghai – presumably the largest urban market in China. The Government of Zhejiang sets a strategic goal of integrating resources to focus on providing assistance to market agricultural and food products produced in Zhejiang. The key objective is to help farmers in Zhejiang to get their products into supermarkets. One of the plans is to establish 60 marketing centers, 20 agri-food distribution centers, and 5 exhibition centers in the province over the next five years. The investment for the distribution centers will come from both the government and the private sector. The government is prepared to invest about 60 million RMB in the next five years to establish the distribution centers. The center will run like a private company with initial funding support from the provincial government.

A number of new initiatives are: 1) Food safety is an issue about which to be concerned. The company is considering a plan to establish a traceability system. 2) Modernize the distribution center so it can link with supermarkets easily. 3) Look for alternative markets to counter the power of supermarkets. 4) Reform the company to become a shareholder company to improve efficiency. 5) Establish a chain that integrates research, product development, production, and marketing together. 6) Transition to third party inspection for safety and quality.

Market Linkage Program 8: Government Sponsored Market Linkage Initiative through Colleges

On November 5, 2009, the General Offices of the Ministry of Education (MOE), the MoA, and the MOFCOM jointly issued a guidance document titled "Notice about establishing Pilot Linkages of Colleges with Farmer Cooperatives and Agri-enterprises". Under the pilots, farmers, farmer cooperatives, agri-enterprises and colleges sign an agreement, then farmers, cooperatives, and agricultural enterprises will supply agricultural products to colleges directly without any other intermediate links. Such direct linkage is expected to give farmers more stable sales channels and prices, and at the same time, reduces intermediate links and the marketing cost of circulation, and benefits the students through improved food safety and boosts farmer incomes.

Under the pilots, a number of upgrading measures are called for: 1) Increase investment in fresh agricultural products modern circulation facilities and cold storage refrigeration facilities. Strengthen the implementation of mandatory

cold chain circulation, reduce the loss of fresh agricultural products, and ensure the quality of fresh agricultural products. 2) Enhance the capacity to process and distribute fresh agricultural products. Support relevant enterprises and farmers' professional cooperatives by establishing fresh agricultural products distribution centers, developing third party logistics in line with the increase in the distribution of fresh agricultural products, and establish agricultural production logistics distribution systems adapted to the size of the production base and the demand of colleges. 3) Improve the informatization management level. Support colleges in their establishment of an open and fair electronic procurement platform, give full play to the advantages of electronic commerce ordering and distribution integration in guiding the university to purchase safe agricultural products. Use electronic information technology to facilitate the integration and interflow of college systems and other systems, to improve the market's ability to react, and establish fresh agricultural products quality traceability systems. 4) Expand the scale of direct purchasing from farmer cooperatives. Widely publicize and support farmer cooperatives with large scale productions, higher safety levels and independent brands that provide reliably high quality and safe agricultural products to colleges, and promote the scaling up of farmers cooperatives fresh agricultural product sales. 5) Establish a farmer cooperative and agri-enterprise to college linkage channel. Functional departments should organize farmer cooperatives, large chain commercial enterprises and local universities to build a docking platform and channel through the regular special symposium, product display seminar and other gatherings.

The policy document also puts forward three measures of support. First, strengthening policy support. Agricultural product storage facility construction land is to be regarded as industrial land. Encourage local government to arrange corresponding funds to support the development of fresh agricultural product cold chain system construction, and fresh agricultural product farmer cooperative and agri-enterprise to college linkage business. Second, broaden the investment and financing channels. Guide social capital investing in fresh agricultural production and circulation infrastructure using policy levers. Help to coordinate financial institutions' supply of credit to fresh agricultural product "farmer cooperative and agri-enterprise to college linkage" and provide technical guidance to related projects' loan application. Third, strengthen the implementation of work. In the pilot area, functional departments must collaborate closely to promote farmer cooperative and agri-enterprise to college linkage pilot work.

On August 17, 2011, the China Farmer Cooperative and Agri-enterprise to College Linkage Network, which is a B2B website that links universities and suppliers, and provides commodity trading and distribution services and financial services, was formally opened. Universities can make and automatically collect electronic orders to suppliers in order to increase the order completion speed and improve suppliers' logistics distribution capacity.

The China Farmer Cooperative and Agri-enterprise to College Linkage Network's participants include more than 3,000 universities, 80,000 leading enterprises, and 360,000 farmers' professional cooperatives, and small and medium-sized enterprise in China. Since April 2010, the service network held many farmer cooperative and agri-enterprise to college linkage symposium

training classes, which were supported by the ministry of education and ministry of agriculture. The network plans to expand so that more than 50% of the colleges in pilot cities will direct their purchases of agricultural products through the system and farmers' professional cooperatives, and to establish a retrospective agricultural food safety cold chain logistics system than extends from point of origin to sales terminal by the end of 2013.