Technical Report on Agricultural Value Chain

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People’s Republic of China: Shanxi Inclusive Agricultural Value Chain Development Project
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ABBREVIATIONS

ADB – Asian Development Bank
AVC – agricultural value chain
AVCAP – agricultural value chain action plan
FAP – featured agricultural product
FI – financial institution
IB – inclusive business
PAC – project agribusiness company
PMO – project management office
PPTA – project preparatory technical assistance
PRC – People’s Republic of China
SPG – Shanxi Provincial Government
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A. Introduction

1. Rural poverty is still prevalent in Shanxi Province. Nearly half of the counties in the province are still designated as national or provincial level poor counties. With the declining of mining industry in Shanxi economy, agriculture is considered as a key sector to address rural development and poverty reduction. However, the agricultural sectors only contribute 6.2% of the provincial gross domestic product due to low levels of productivity and value addition.\(^1\)

2. The Shanxi Provincial Government (SPG) approached ADB for a loan to develop the private agribusiness in Shanxi, especially in the poverty-stricken areas, to better realize poverty alleviation targets by applying the Agricultural Value Chain (AVC) approach.

3. ADB contracted Rabobank International Advisory Service (RIAS) to conduct the AVC analysis for 4 Project Agribusiness Companies (PACs) in Project Preparatory Technical Assistance (PPTA) phase. A number of field surveys, meetings and trainings were held by 2 international and 2 national consultants during Sep. 2016 to March. 2017, which aims to give a full picture of the current AVC development status in Shanxi province and support the project management office (PMO) and PACs in developing their business according to AVC methodology.

B. Development Status and Issues of Agribusiness in Shanxi

4. Overall situation. Shanxi is an inland province with limited arable land. The mountains and hills cover more than 80% of the province, which makes the province hardly develop large-scale agricultural operation. However, Shanxi province has its own advantages in developing some agricultural sectors, for instance livestock and meat, coarse cereals, vegetables, fruits, mushrooms and Chinese herbs,\(^2\) to produce Featured Agricultural Products (FAP). It’s observed that there are still some problems restrict the agricultural economic growth in the province, which includes small scale operation,\(^3\) low concentration,\(^4\) less value addition and financial constraints. The following agricultural development issues should be given more concerns:

   (i) Planning on the AVC development. The improvement of agricultural products quality and production efficiency depends on the coordination of all AVC stakeholders, and the optimization on a certain part of AVC may not be able to drive the overall development. The lack of overall planning in the AVC development project is likely to cause the mismatch of capacity and funding, which may affect the agricultural production efficiency.

   (ii) Information interactions. In the AVC, the efficiency and accuracy of information transmission from the sales segment on market changes

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\(^2\) The agricultural gross domestic product reached $14.04 billion in 2015 that were mainly contributed by these sectors. From the Shanxi Statistic Yearbook 2015.

\(^3\) The total revenue of agricultural dragon head companies is only $2.06 billion in 2015, which is in the last of central Chinese provinces.

\(^4\) More than 300 small processing companies spread over 85 counties in the province. The production, processing and sales are generally in different locations, which increased the logistic costs.
determines the profitability of its upstream producers and processors, but this kind of information interaction is sometimes inaccurate or overdue.

(iii) **Farmer's position.** The farmers, especially poor farmers who participate in the AVC, are usually in weak position because of their low organization level, and they hardly share the efforts of the value chain development. This also leads to the instability of the cooperation among the AVC stakeholders.

5. **Typical issues.** There are many risks threaten the success of AVC development plans, just like the fishbone diagram showed below:

6. Among these risks, the following issues in Shanxi project need to be paid special attentions:

   (i) **Issues of core enterprises.** Although the PACs are specialized in different agricultural sectors, they showed some common bottlenecks as small enterprises in development process, which are as follows:

   a. **Weak operational management capacity.** The management capacity in the PACs is hard to meet the increasing demands on business development. The board and senior management of the PACs are generally from non-agricultural sectors and do not hold relative education background.5 Indeed most of them have been working in the area for many years and accumulated abundant experience, but they still have limited opportunity to upgrade their management capacity. The information of advanced production technologies is isolated in some PACs because they don’t have access to external technology supporting. The same as their marketing capacity, most of the PACs produce primary products and supply to several big distributers, which makes them far from the end-consumer’s market and less value was awarded. The core competence of the PACs should be further strengthened.

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5 Some entrepreneurs are from mining sector and shifted to agriculture around 2010 when the Chinese government decided to close small coal pits.
b. **Poor financial management.** It is a typical issue that the SMEs financial position is not transparent enough. On one side, the PACs hardly attract skilled accountant due to their locations in rural area therefore they can’t properly produce good financial statements. On the other side, sometimes the entrepreneurs would also deliberately conceal the fact about their debts so as to show a better financial position to potential lenders.

c. **High funding pressure.** Due to the agro-companies and farmers are always lack of collateral, the financial institutions are reluctant to finance their business. They rarely get fix assets loans but sometimes could apply for short-term working capital financings with quite high interest rate. It happened that the PACs invested in fix assets with short team loans and the lending banks decided to pull back credit under internal credit policies, then the company went bankrupt. The new investment on production capacity also leads to higher deficit on working capital to the PACs.6

(ii) **Issues of farmers.** More than 79,000 farmer cooperatives were registered in Shanxi as of 2015 with the involvement of 3.12 million farmer and account for 38% of total rural population.7 However, most of the farmers in the cooperatives are still individually engaged in agricultural production, which means they are incompactly organized and may cause following problems:

a. **High costs on production.** Farmers are unable to share equipment and experience without good organization. They have to choose small tractors and simple agricultural inputs with limited investment, which leads to the inefficient agricultural production. And it’s also difficult to guarantee the food security in such small-scale operations.

b. **Low bargaining power.** The core companies have strong position in the AVCs. They are the price-maker who can formulate the trading terms and price, once the individual farmer decides to join the business, they have to abide by the terms and accept the price even sometimes it’s not fair.

c. **Financing constraints.** Most of the farmer cooperatives do not have sound business and financial management records, which makes them being unable to apply bank loans to support their business expansion.

(iii) **Issues of the linkages between AVC stakeholders.** The AVCs in Shanxi are mostly supply driven instead of demand. In each AVC, it is important to have a strong value chain leader who can understand the demands of the end market and translate the information back to the AVC partners. However, most of these SMEs in Shanxi are primary producer who are not familiar with the consumer’s preference. This may lead to the following impacts:

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6 Especially to the project companies, it will cause great working capital gap for both the PACs and their upstream and downstream partners after the newly built investments put into operation.

a. **Inefficient information exchange.** It is common to see that the core companies are usually unable to obtain market change information, to say nothing of the information transmission to up-stream companies and farmers.

b. **Low stimulation to skillful farmers.** Motivation to the agricultural production which conform the end specifications should be stimulated by a fair repayment system. However, we observed that some of the PACs give fixed price on input supply or products repurchase to protect the farmers from the market risk. On the other hand, it also limits the farmers earning generating capacities when the market price is going up.

c. **Unstable business relationship.** The core enterprises sometimes invested in their up and down stream business to gain more benefits or cut costs. This brings big funding demands to the core enterprises and eliminates co-operations with other AVC partners. Actually, it is proved that the full integration is not the best choice to develop agribusiness, but the good cooperation organized by the chain leader could demonstrate higher operating efficiency and spread risks.

**(iv) Issues of the profit distribution along the AVC.** AVC stakeholders share the profits created through the production and marketing process in different proportions based on their capital and labor investments. However, the farmers are sometimes unfairly paid due to their weak positions in the AVC. The issues are as follows:

a. **The farmers have less opportunity on income growing.** Due to the absence of self-governance capacity in the farmer cooperatives, the core enterprises have to pay lots of efforts on organizing the farmers to provide required primary products in some labor-intensive parts of the AVC. Thus, the company could decide who can participate and how much they would be paid. To compare with the big investment on livestock husbandry or processing facilities, the farmers’ fortune accumulated through primary production is far from actual needs and this makes them scarcely possible to build their own farm.

b. **The value of products could be further increased.** The ultimate object of improving value chains is to increase the total amount and value of agricultural products in the value chain and the margins for the poor. Most of the agricultural products in Shanxi province are simply processed and do not certified by food safety and traceability system, which limited the value-creating abilities.

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8 Spot transactions widely existed in planting sectors and the orders to animal protein products are ordinarily in size and quantity rather than quality indicators.

9 ADB. *Making Value Chain Work Better for the Poor*
C. Value Chain Approach and Its Characteristics

7. **Definition.** There is no commonly agreed definition of what is actually meant by agricultural value chains. The AVC hereinafter referred to as the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs.\(^\text{10}\) A value chain exists when all stakeholders in the chain operate in a way to maximize the generation of value along the chain.

8. The AVC analysis looks into the various actors\(^\text{11}\) from raw material to the retail of the final product. It gives much attention to forward and backward linkages and external network organizations\(^\text{12}\) which can influence the success of AVC development.

9. **Analytical tools and processes.** Many NGO’s and research institutions supporting poverty alleviation and agricultural development have published a series of documents designed to assist users to conduct AVC analysis. The tools to be used in the AVC analysis highly depend on the analytical purposes, but in general it could be concluded as following main stages:

   (i) **Mapping the value chain.** ‘One picture says more than a thousand words’. Making a value chain map could visualize the networks to get a better understanding of connections between actors and processes in a value chain. It also demonstrate roles,\(^\text{13}\) functions and interdependency between actors and processes in the value chain, and the information exchange, production capacity matching, linkage, governance and employment are all possible to be illustrated or stated out through AVC map.

   (ii) **Financial analysis to the AVC.** After having mapped the value chain, the profits and costs distribution of AVC stakeholders could be further calculated. The financial analysis aims to find out the current financial situations of AVC and the impacts and changes when the AVC intervention activities are implemented. In this way, the results of AVC development plans could be evaluated.

   (iii) **Define risks in each segment and translate into action plans.** The risks at each stage of the AVC should be analyzed and addressed including possible mitigations from the view of internal management, financial positions, material supply, marketing, operational models, technology and environment etc. Some risks are only applicable for a specific stage in the VC, and the other risks are cross cutting and can be referred to as supply chain disruption. Whatever the risks are, it must be given enough concerns and reflected in the AVC development action plans.


\(^{11}\) Input suppliers, farmers, processors, traders, service providers, extension service, exporters etc.

\(^{12}\) Government, NGOs, organizations, research institutes and universities, etc.

\(^{13}\) Especially recognize who is the core enterprise in the AVC and what’s the cooperation model with the up and down stream companies and farmers.
10. **Advantages of applying value chain analysis in the project.** As primary industry, the success of agriculture sector highly relies on the co-development of all AVC stakeholders. The "Sanlu milk powder" incident in 2008 has aroused the public concern of food safety in China, which showed the complexity to coordinate the AVC partners in development process. The chain, from the beginning of agricultural input supply to the food processing, need to be supervised under strict food security standard. Meanwhile, the partners along the AVC should continuously improve their production efficiency and diversify their products to be more competitive and make it better connect with end consumer markets. To compare with traditional financing supports to single entity, the way of applying value chain approach in an anti-poverty project has following advantages:

(i) **More accurate analysis of the risks.** The value chain approach gives better understanding of the risks in all AVC stages. The investments on core companies’ productivity construction must bring changes to the business relationship with up and down stream companies, and relative countermeasures can be made only when these risks are sufficiently disclosed.

(ii) **Give solutions to the financing problems of farmers and agro-SMEs.** The value chain approach could facilitate the financing needs of farmers and agro-SMEs which are generally deemed as high risk business and less interest in financial institutions. It one side provides more information about the sector, customer and their relationships to the banks to reduce the information asymmetry. On the other side, also promote the design of supply chain finance products based on the logistics and fund flows in the value chain.

(iii) **Stronger external capacity building supports.** The training on value chain methodology will enhance the management capacity of core companies by taking them to a broader scope to see the business development in the chain. Besides, it also gives guidance to the project leader and executer who are responsible to design and conduct suitable external capacity building services to the companies and farmers.

(iv) **More accurate evaluation on poverty alleviation result.** The actual income growth of poor farmers could be measured through value chain financial analysis. To compare the increment of absolute amounts and shares before and after value chain intervention, we could evaluate whether the value chain developing efforts are well shared with poor farmers and sustainable or not.

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14 The farmers supplied raw milk to Sanlu mixed melamine, a non-alimentary chemical which causes kidney stones, with the milk to improve the protein level. About 300,000 babies became ill, and six cases resulted in death and eventually lead to the demise of the company in 2008.

15 The changes are not limited to the production capacity, but also to the co-operation model. For instance, the broiler slaughtering company may stop purchase of farmer’s products if they invested in their own production base. The negative impact is the farmer may return to poverty if he was kicked out before the investment was paid back.

16 The typical supply chain finance model is the bank gives credit to farmer or farmer cooperatives based on the inventory, account receivables and payables with core enterprises.
D. Business Case on AVC Development

11. The methodology of AVC development has been adopted for different purposes in some agricultural projects, which demonstrated the feasibility of applying value chain approach to improve agricultural development in the PRC. The core enterprises used the concept to assess their business plans, the financial institutions developed financial products based on the AVC relations and the governments conducted the poverty alleviation plans through AVC development activities. A case here below illustrates how those parties work together to realize the co-development of the value chain.

(i) Facts and problems. Wuliming is a town located in Suihua, Heilongjiang Province with total population of 39,976 and arable land 11,734 hectares. During 2006–2008, the farmers’ income in this region is much lower\(^{17}\) than national and provincial average because of the decline of soil quality and poor farming infrastructure. And due to lack of collaterals, the farmers hardly applied bank loans to change their old farming equipment, nor give more investments on irrigation facilities.

(ii) Solutions and action plans. The local government realized that there must be an overall solution which could mobilize all related parties to change the situation. Then a cooperation model based on value chain development approach was designed and conducted with AVC partners, financial institutions and agro-universities. The main framework is as below:

![Diagram of multiparty contracts]

- Relieved financial constraints to farmer & farmer cooperatives
- Optimized development environment and solved the sales problem by contract farming
- Promoted local agro-economy growth and poverty alleviation

12. The farmers in the town were organized in the farming cooperatives to produce agro-products for the core company and 35% of the cooperative net profit was retained as risk reserve and loan guarantee fund. The local government helped the cooperatives to build sound internal management and subsidized their investments on equipment and infrastructure constructions. With the purchase contract and good financial performance, local banks started to show their interests on the farmers’ financing needs and eventually it made good combination of relative resources to form an enabling environment for the AVC development.

(iii) Efforts and Impacts
a. Agricultural productivity was greatly improved by using modern

\(^{17}\text{The rural per capita income in Suihua is }$420, $461 \text{ and }$545 \text{ during }2006-2008. Journal of Suihua Collage. Oct. 2009.\)
farming equipment and techniques in large-scale operation farms. The output of maize per mu increased from 0.6 to 1 ton. The threat of nature disaster was lower than before and partly migrated by agricultural insurance.

b. **Relieved financial constraints to farmers and farmer cooperatives.** The business model gave confidence to the banks that the farmer cooperatives with sound management also could be eligible entity to be financed. With financial supports, the farmer cooperatives not only strengthened their production capacity, but also enforced their independency and bargaining power to gain more profits on behalf of the farmers.

c. **Increased the farmers’ income and broadened revenue sources.** It doesn’t require large labor input in modern agriculture. So, the skilful farmers remained to work in the cooperatives while the others may be engaged in livestock husbandry or find a job in the cities. The rural per capita income in Wuliming town increased to $1,756 as of 2012 which is 40% higher than that of provincial standard. The value chain development plans give good results on the improvement of farmer livelihood.

E. **Project Preparation and Design**

13. ADB has introduced the value chain approach to Shanxi Inclusive and Agricultural Value Chain Project for the sub-projects selection, AVC action plan formulation and project design in the PPTA phase and the project will demonstrate effective ways to advance the agriculture sectors in Shanxi. Main activities have been conducted, including the following:

(i) **Sectors and PACs selection.** Given that the distribution of natural resources and the length of value chain in regions are different, it’s very important to select suitable agricultural sectors and PACs with high development potential and good IB prospect in Shanxi province. To achieve this target, ADB has organized consultants to screen the candidate project companies and 23 PACs conformed to the AVC development and IB criteria were selected among 44 companies. These PACs will take the role of core enterprise in which the subprojects invest, and the following action plans will be made on the PACs and extend to their partners through the linkage in the value chain.

(ii) **Initial AVC analysis was made to four PACs.** The value chain mapping and financial analysis to 4 PACs in broiler, mushroom, jujube and vegetable sectors had been conducted by AVC specialists during PPTA phase. The changes on profits and costs of the local value chain stakeholders were measured in the time-points of present and after the project construction. The information communication mechanism and efficiency are evaluated and bottlenecks and risks which may restrict the development of the AVC were concluded in the final

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18 The case number will be increased to eight PACs in project implementation stage.
reports of each AVC field mission.

(iii) **Action plans to four PACs were formulated.** Combined with the current situation of the PACs and the value chain they located, development proposals covering corporate governance, business operation, production technology, marketing and cooperation relationships were summarized and communicated with companies’ management. While based on these common goals, a soft component of the project on capacity building to the PACs and the farmer cooperatives has been put on the agenda. ADB and PMO could provide advisory services together with specialists and agencies during loan implementation to help the core enterprises to fine tune their business model and management, and to improve their partnership with upstream or downstream partners, especially farmers, by organizing various kinds of trainings, workshops, exhibitions and field coaching activities.

(iv) **Capacity building for PMOs and PACs on value chain concept and approach was carried out in PPTA.** The training and coaching were given to the PMOs and PACs in the field visits and wrap-meetings by AVC consultant, which aims to embed the concept of AVC development into the project and business planning. Therefore, the PACs could further utilize the AVC approach to optimize their business plan while the PMOs could also give better supporting and develop dialogs with services providers and local governments to catalyze solutions to the common needs of players along model value chains.

(v) **The AVC development assessment and monitoring measures were developed.** In the project implementation phase, the value chain development indicators should be taken as important references to evaluate the project progress and efforts. A checking list with qualitative and quantitative indicators which could be used for the AVC development assessment has been developed by the consultant. Through plan-do-check-adapt management cycle, the action plans in (ii) could be continuously improved. Then the core enterprises supported by this project could obtain sustainable development capacity by gradually building their core competitiveness. Only in this way can a better effect on inclusive business be realized in future and poor farmers award more growth opportunities.

F. **Expected Outcomes**

14. Although there are still some problems which can’t be shortly solved in the project but requires long term investments,\(^\text{19}\) it is proven that the value chain approach will definitely

\(^{19}\)It took 5 years from the project design to achieve a preliminary success in the business case of Chapter D. In the first 2 years, the project mainly focused on some fundamental issues like the registration of farmer lands, formulation of farmer cooperatives, building relationship with core enterprise and making arrangements with the FIs and technology providers etc. The issues about R&D, marketing and branding required more time to be continuously improved by the AVC stakeholders in following years.
reduce the project risks and bring more development opportunities to the PACs and farmers in the value chain. The expected outcomes are showed in below diagram:

(i) **Improve the efficiency of the AVCs in the project.** Through the project investment and capacity building, the following targets could be gradually achieved:
   a. The management capacity and profitability of the project companies can be further strengthened;
   b. The cooperation between the core enterprises and their upstream and downstream partners, especially the farmers with good production skills and management potentials, can be further stabilized;
   c. The farmer cooperatives could be established and given strong supporting on management by capacity building activities in the project;
   d. The Information exchange on the AVC will be more efficient and the production, processing, marketing of the agricultural products will be more market oriented;
   e. These project AVCs will build their overall competitiveness by smooth and stable cooperation among the stakeholders.

(ii) **Increase financing availabilities of farmers and agro-SMEs.** The long-standing problems of financing constraints to farmers and agro-SMEs can be solved through value chain finance model. The information disclosure will be more transparent and the information asymmetry between banks and borrowers will be greatly reduced. Then the farmers and agro-SMEs could be financed by financial institutions with reasonable and affordable financing price.

(iii) **Reduce project risks.** Besides the PACs’ operational risks, the project will also well evaluate, disclose and migrate the other value chain stakeholders’ risks by applying value chain approach, which could safeguard the success of the project. Through the multiple communications with PACs, farmer and farmer cooperatives, PMOs, local governments, financial institutions and external
service agencies, an enabling environment for the agribusiness development will be created by the supporting from these parties. And the concrete measures to address above issues in Chapter B will be incorporate into the action plans in each stage.

(iv) **Support the realization of inclusive business targets.** The improvement of farmer organizational level was paid high attentions in the project design and implementation. To compare with the large registered amount, the current number of well managed farmer cooperative is not much, which makes the PMO and local government officers are not very confidence on developing farmer cooperatives in Shanxi. Nevertheless, we can still find some successful cases on farmer cooperative development in the PRC and give good reference to the project implementation. With supporting from professional capacity building agencies and core enterprises, the managers in the cooperative could be trained and be capable to run agribusiness on behalf of the farmers. Later on, the social service functions in the farmer cooperatives could also be developed by taking reference of agricultural association models in South Korea and Japan.20 In this way, the farmer cooperatives will become real independent entity with financing capacity and strong bargaining power so as to change the traditional employment relationship between farmers and enterprises and to create better development space for farmers.

(v) **Give demonstration for following projects.** Firstly, the 24 PACs will be divided into two groups that one group with 8 PACs in AVC development projects and 16 without. Their business development and poverty-relief effect will be regularly measured and compared, then the project experience could be concluded, which lays the foundation to optimize following action plans and guide the project implementation in future. Secondly, the AVC analysis manual and case study publications will be summarized based on the practice of Shanxi project to provide reference to other similar agricultural poverty alleviation projects. The last but not the least, the talents, whoever from the PACs and PMOs, are developed their personal ability through such a project, which will consistently contribute to the poverty alleviation works and make a better life for the poor in Shanxi as well as nationwide.

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20 The model of National Agricultural Cooperative Federation (NACF) from South Korea has been introduced to China and got great success in Yongji, Shanxi province. This called rural community is not just a production organization, but also covers some social responsibilities like taking care of olds and children in the village.
APPENDIX 1: ACTION PLAN ON VALUE CHAIN DEVELOPMENT FOR SHUDE JUJUBE CO., LTD.

A. Composition

1. The project is about investment in food industry, whose main products include jujube-based products, walnuts, coarse grains paste with honey and other specialty agricultural products. In term of product attributes and market demand, the end products of this project fall into the category of mass fast-moving consumer goods with relatively stable market demand. In term of composition of the industry chain, jujube’s industry chain has relatively simple sections. Its upstream encompasses seedling farmers, fertilizer factories, jujube plantations contracted by farmers or enterprises, while its downstream mainly comprises small companies and agricultural cooperatives conducting sorting, screening and drying of fresh jujubes, processing and marketing enterprises and channel distributors who would package jujube products and launch brand marketing.

2. Currently, the business scope of Shude Jujube Co., Ltd. mainly covers jujube cultivation, processing, storage and marketing. The related parties of the industry chain are as follow:
   (i) Producing: farmers who grow jujubes and specialty agricultural products, agricultural distributors, nurseries
   (ii) Processing: 21 small jujube processing plants and agricultural cooperatives
   (iii) Marketing: e-commerce platforms, wholesalers, end consumers

B. Value Chain Distribution and Development

3. Through establishing data models and taking actual business data of related parties in 2016 as reference, contrast and analysis have been carried out on gross profit distribution, gross profit, selling price and total revenue of each related party involved in the value chain before and after investment in Shude Jujube. The main conclusions are as follow:
   (i) After the implementation of investment project, selling price and gross profit of farmers and Shude Jujube increase. From the perspective of farmers, thanks to the newly established jujube pulp production line, defective jujubes which cannot be sold can be used for production. Thus, the sales rate and sales volume of jujube are improved, which contributes to the increase in gross profit and average selling price. From the perspective of 21 small jujube processing plants, jujubes procured for pulp production can skip the procedure of scanning and processing and its selling price decreases as a result, which leads to a decline in average selling price of products and gross profit of processors.
the perspective of Shude Jujube, jujube pulp, as the relatively high value-added product gives impetus to the increase in average selling price of products and gross profit.

(ii) The proportion of the gross profit of farmers and Shude Jujube enjoy further rise in the value chain. Given the increase in gross profit and average selling price, the proportion of farmers’ gross profit goes up from 13.46% to 17.95%; the proportion of Shude Jujube’s gross profit rises from 49.14% to 58.12%, while 21 small jujube processing plants’ gross profit proportion drops from 37.4% to 23.93%.
The total revenue of each related party of the value chain is up. After the investment, a new production line and original ones can produce together, improving the output of each section. In addition, new products possess relatively high added value, increasing the average selling price. Thus, the surge of the total revenue of each related party of the value chain is achieved.

C. Development and Major Risks

4. Shilou County Shude Jujube Co., Ltd. provides one-stop services including jujube cultivation, processing, marketing and research. The Company is committed to
standardization, diversification, continuity, reputation and pragmatism. It joins forces with 21 small processing plants and farmers. Under this business model, fertilizers and production technologies have been provided free for more than 8,000 farmers engaged in jujube and specialty agricultural products processing, demonstrating the inclusiveness and positive social impacts of the Company.

5. When applying for this project, Shilou County Shude Jujube Co., Ltd. plans to extend the original processing plant and build a new production base for deep processing of jujube and specialty agricultural products, expanding the scope of end products and processing capacity, improving products’ quality and production efficiency, reducing the cost of logistics and transportation. Although the completion of the project can boost value creation in the value chain significantly, the following risks of the project should deserve full attention.

(i) Farmers’ production technologies need to be further improved. Currently, most agricultural production is carried out by independent farmers, each of whom owns 30-60 mu (2-4 hectares) of production area. Although the Company offers farmers free production technologies guidance, restricted by infrastructure and capacity of agricultural technology services, some conditions may still lead to failure of fresh jujubes to meet quality demand, see below for specific conditions:
   a. Farmers’ production is affected by natural conditions (such as low temperature during pollination or rainy during the harvest period);
   b. Due to mountainous areas, rainproof facilities cannot be built, hindering the improvement of jujubes’ quality;
   c. The scope of agricultural technology services needs to be further expanded and more support should go to fruit tree cultivation and breeding technology; and
   d. The production efficiency of farmers can be further enhanced and the optimal spacing within the unit needs to be further demonstrated.

(ii) Information communication among upstream enterprises, downstream enterprises and farmers should be more transparent and efficient:
   a. Production indicators for farmers should be further defined and quantified. Lack of quantitative indicators, 21 processing plants mainly procure and determine the grades and price of jujubes by rule of thumb. Market demand can be further clarified on this regard. When enterprises emphasize that their own competitive advantage lies in the production of green pollution-free products, the quality standards of relevant products should be passed on to consumers in an explicit manner. However, at present main indicators of procurement focus on size and loss rate, lacking more refined indicators system to establish direct connection between quality and procurement price;
   b. Production quality indicators for processing plants should be further defined and quantified. Considering that Shude Jujube plans to enhance the value of the product by improving the quality of end products, the Company needs to impose more specific production quality standard in line with the requirement of the quality certification
system and the traceability system on 21 small processing plants so as to ensure end products meeting the quality standard;

(c) Reduce the procurement cost that 21 processing plants charge the farmers. Under the current mode of cooperation, Shude Jujube, as a core enterprise, connect the upstream sector—21 small processing plants and more than 8,000 farmers to the downstream sector—end consumers and domestic and foreign wholesalers. With the newly established capacity put into place, Shude Jujube and its 21 processing plants are bound to purchase more raw materials and establish or expand distribution channels. Especially when dealing with scattered farmers, brokers and processing companies in upstream, Shude Jujube and its 21 small processing plants may incur a relatively high cost of procurement, management and technologies services. However, the communication cost can be reduced by improving the level of organized operation of farmers; and

(d) Forge processing technologies of new products. Given the fact that the newly built jujube pulp production line does not belong to Shude Jujube’s original business scope, the Company should promote the technology capacity-building, cultivating their own production technicians who can master the efficient production technologies of jujube pulp.

(iii) Diversify distribution channels of deep processing products. Shude Jujube attaches importance on branding and witnesses a positive brand effect in the past few years. However, the distribution channels of original products (jujube with walnut, candied jujube, black jujube, dried jujube) slightly differ from those of jujube pulp and other new deep processing products. The distribution of new products relies heavily on an enterprise, a partner in the future, which might put the Company in a weaker position on bargaining with the enterprise. Thus, Shude Jujube needs to establish their core competitive advantage as soon as possible and expand the corresponding distribution channels;

(iv) For related parties in the value chain, they need diversified financial services for future operation and development. Currently, Shude Jujube has already raised enough funds for the project construction, but there is continuous demand for financing land purchase and working capital. In addition, to improve production facilities and production capacity and even in daily life, farmers still have the demand for comprehensive financial services, deserving full consideration in line with the value chain development plan; and

(v) The transportation cost of end products of the Company might be relatively high. Considering Shilou’s unfavorable location—remote mountainous area, highways under construction and long distance, the cost of product transportation might be high.
D. Development Measures for the Value Chain

6. To deal with the risks listed above, Shude Jujube will focus on the following aspects in the project to prevent them.

(i) Improve farmers’ production facilities and production technologies. Firstly, find the solutions to enhancing production efficiency and quality of agricultural products for farmers. Secondly, improve the conditions of drying and storage of jujube for farmers. It is recommended that enterprises and external partners should provide corresponding technology and service support for farmers and coordinate financial institutions to meet farmers’ financing demand for improving agricultural production environment;

(ii) Master production technologies of new products ASAP. Apart from reliance on current partners, the Company should establish technology cooperation with agriculture and food research institutes or equipment manufacturers, multiplying channels of technical support and ultimately fostering efficient production capacity of new products ASAP;

(iii) Set up agricultural cooperatives and regulate their management. Create information cards for farmers and track their production efficiency and quality. Select farmers who possess fair production skills and help them build well and independently managed agricultural cooperatives. Then companies can deal with agricultural cooperatives directly, reducing management and communication costs, raising farmers’ income and motivating farmers to increase production;

(iv) Strengthen the role of insurance to mitigate risks of production for farmers. Combined with the government subsidy policy, insurance of farmers’ production will be introduced and the coverage of insurance and the scope of settlement will be extended, mitigating the production loss caused by natural disasters that farmers might have to incur;

(v) Improve the efficiency and effect of communication among related parties of the value chain. Formulate the specific standard of procurement for farmers, specify the correlation between quality and price, and draw up the standard of processing and manufacturing for enterprises. Shude Jujube should provide more specific indictors (moisture, drug residues, and nutrient content) of product quality for their partners in upstream;

(vi) Diversify channels of the end products, improve market adaptability. By maintaining current sales trend, Shude Jujube should pinpoint the advantages of new products based on their own characteristics, strengthening the connection between jujube pulp products with market. Through enhancing the understanding of demand for jujube deep processing products and wielding their own resource advantages, Shude Jujube will establish differentiation advantages of their deep processing products, ensuring the demand of the market can be satisfied;

(vii) Deepen the analysis of consumers’ demand. By collecting and sorting feedback from e-commerce platforms and wholesalers, Shude Jujube can keep abreast of changes in consumers’ preference, ensuring the product meets the demand.
in a maximal manner;
(viii) Join the food certification and traceability system. Through cooperating with government and third party testing and certification platform, consumers’ awareness of Shude private brand will be raised and added value of products will be improved; and
(ix) Strengthen the cooperation with local financial institutions. By cooperating with financial institutions like local Rural Credit Cooperatives, Agriculture Bank of China, Postal Savings Bank of China, etc. or non-bank financial institutions like financial leasing, factoring, etc., the financing channels can be expanded to provide adequate working capital.

E. Action Plan Schedule

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Action Plan</th>
<th>Steps</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improve farmers’ production facilities and production technologies</td>
<td>1. Establish communication with research institutes and plant experts</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Obtain suggestions on improving farmers’ production technologies from external experts</td>
<td>Long-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Help farmers communicate with banks that provide financial services on upgrading production facilities and technologies</td>
<td>Medium-term</td>
</tr>
<tr>
<td>2</td>
<td>Master production technologies of new products ASAP</td>
<td>1. Establish communication with technicians of jujube pulp production</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Finish training on production technologies among companies</td>
<td>Medium-term</td>
</tr>
<tr>
<td>3</td>
<td>Set up agricultural cooperatives and regulate their management</td>
<td>1. Create information cards for farmers and record their information of cooperation and production</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Promote cooperation between farmers and external companies; strengthen the management of agricultural cooperatives</td>
<td>Long-term</td>
</tr>
<tr>
<td>4</td>
<td>Strengthen the role of insurance to mitigate risks of production for farmers</td>
<td>1. Work together with local government to upgrade the insurance product for farmers</td>
<td>Medium-term</td>
</tr>
<tr>
<td>5</td>
<td>Improve the efficiency and effect of communication among related parties involved in the value chain</td>
<td>1. Formulate indicators of production based on the standard of organic food</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Hold seminars on different levels to convey requirement of production</td>
<td>Medium-term, Long-term</td>
</tr>
<tr>
<td>6</td>
<td>Diversify sales channels of end products and improve market adaptability</td>
<td>1. Diversify sales channels and reach more product procurers</td>
<td>Long-term</td>
</tr>
<tr>
<td>7</td>
<td>Deepen the analysis of consumers’ demand</td>
<td>1. Improve the process of tracking clients’ feedback and set up regulation of product maintenance and upgrading</td>
<td>Short-term</td>
</tr>
<tr>
<td>8</td>
<td>Join the food certification and</td>
<td>1. Confirm the requirement of the quality certification system</td>
<td>Short-term</td>
</tr>
<tr>
<td>Serial No.</td>
<td>Action Plan</td>
<td>Steps</td>
<td>Duration</td>
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<td></td>
<td>traceability system</td>
<td>2. Strengthen quality control of products and ensure products meeting the requirement of the quality certification system</td>
<td>Medium-term, Long-term</td>
</tr>
<tr>
<td>9</td>
<td>Enhance the cooperation with local financial institutions</td>
<td>1. Discuss working capital loan with local financial institutions</td>
<td>Medium-term</td>
</tr>
</tbody>
</table>

Note: Short-term: 3-6 months; Medium-term: 6-12 months; Long-term: more than 12 months
APPENDIX 2: ACTION PLAN ON VALUE CHAIN DEVELOPMENT FOR XINJIANG WHOLESALES MARKET OF VEGETABLES IN SHANXI PROVINCE

A. Composition

1. This project is about investment in vegetable wholesales industry. It builds cold storage and cold chain logistics, which optimizes the service of vegetable products flow. As to the product attributes and market demand, vegetables fall into the category of fast-moving consumer goods with multiple kinds and multiple harvesting and a stable market demand. In terms of the industrial chain composition, the production and trade chain of vegetables is relatively short. On this chain, the supplier of seeds and fertilizers at upstream are core enterprises possessing certain production technologies with relatively large capital, seedling goes to big-scaled farmers, small-scaled agricultural companies and grower cooperatives while the vegetable production is conducted by growers and grower cooperatives. The logistics of vegetable products includes middlemen, transportation, cold storage and trade market. The final products enter the consumer market through big wholesalers at various places.

2. Shanxi Xinjiang Vegetable Industrial Development Co., Ltd. is a key vegetable collector and wholesaler in Shanxi Province, providing a main platform for marketing products yielded from 120,000 mu (8,000 hectares) of land from 17,000 fruit growers and 80 villages specialized in producing vegetables. It plays a big part in the industrial chain. Aside from its role as the trading floor, it provides such other services as examining product quality, helping arrange logistics, classifying, sorting and packing, collecting and disclosing market information. The related parties of the industry chain are as follow:
   (i) Producing: vegetable growers, agricultural cooperatives
   (ii) Processing: middleman, buyer and logistics companies
   (iii) Trading: inspection and quarantine institutions, trade information platform for agricultural products

B. Value Chain Distribution and Development

3. Through establishing data models, analysis has been carried out on the distribution and proportion of gross profit among vegetable growers, middlemen and vegetable markets after the cold storage has been built as well as changes to their total revenue, the main conclusions are as follows:
   (i) Thanks to the construction of the new cold storage and cold chain logistics, waste in agricultural products is greatly reduced while the sales rate of vegetable growers is promoted. As a result, the average sales price for growers grows from 0.67yuan per kilo to 0.73yuan per kilo while middlemen’s
commission and market price remain the same. Thus, the average profit rate stays the same. (Currency unit, Chinese Yuan)

(ii) Due to lack of information, we do not analyze changes in retail prices. However, in Xinjiang, growers’ gross profit per kilo still accounts for 94.37% of total vegetable production and trade mainly because that investment in production all came from growers.

(iii) Since the trading environment has been improved, the trade volume will see sharp rise, driving increase in total sales revenue for all parties involved in local value chain. The following bar chart shows such changes (Currency unit: in Million Chinese Yuan),
C. Development and Main Risks

4. In the value chain of vegetable production, the wholesales market connecting both buyers and sellers has access to trade information, and based on which it can judge the market trend and consumer needs. Therefore, it becomes the leader of the value chain and plays a vital role in information flow of the value chain. All matured vegetable wholesales markets in our country (e.g. Shouguang in Shangdong, Xinfadi in Beijing and Jinhua Agricultural Products Wholesales Market) provide supporting services aside from functioning as a trade platform, including logistics, cold storage and price guidance. Meanwhile, they also charge fees in proportion to the trade volume they have helped to accomplish as their main operating revenue.

5. Xinjiang Wholesales Market of Vegetables (now known as Xinjiang Vegetable Industrial Development Co. Ltd.) was established in 1994. Despite of its years of operation, it still lacks of facilities to provide supporting services. Due to lack of freezing facility, local vegetables have to be delivered in two batches to other freezers for storage before transportation. Without cold chain logistics, over 800 kilometers long-distance transportation of leafy vegetables suffer up to 20% loss. Insufficient supporting services have made trade cost much higher and growers’ profit lower. To crack this hard nut, applying for building up cold storage and cold chain logistics facilities through this project will not only improve market and trading environment but also help reduce trade cost and product loss effectively so as to promote local growers’ income. This project is to optimize trading environment and has no direct impact on the positions and roles of main parties in the value chain, their partnerships, production capacities or value distribution. However, the following problems concerning the development of the value chain should be given much attention.

(i) Improve the efficiency of sharing information on market demand among all parties of the value chain. The value chain is supply-driven instead of demand-driven. Main trading bodies are various vegetable brokers. Wholesales markets of vegetables, although participate in collecting local market transaction price, do not provide in-depth analysis on market information or pass information of end consumer markets’ demand on quantities and qualities of products to vegetable growers;
(ii) Both production techniques and facilities have to be further improved. Most growers continue to adopt simple greenhouse to grow vegetables, which requires high maintenance cost and hinders the improvement of production efficiency as well as vegetable quality. What's more, growers rely on agro-technique extension staff from local government for new techniques, thus the application of new brands, new equipment and new techniques is rather slow.

(iii) Growers lack of financing channels to upgrade their production facilities. Some growers plan to modify their greenhouses for higher production efficiency and better product quality but can hardly get financing support from banks due to lack of collateral or mortgage;

(iv) Vegetable growers need to be well organized. Currently, most vegetable growers work independently. They are not part of a united organization in purchasing raw materials, planning planting breeds, technology training, harvest and sales management. Hence, their production cost remains high and their bargaining power in selling products is weakened;

(v) Quality control system needs further improvement. Although there is a lab under quality supervision department at the wholesale market, inspection is limited to some basic indexes to guarantee food safety. Stricter quality inspection is missing, such as inspection on the amount of various nutrients and organic certification etc.;

(vi) Lack of technology and management specialists on cold storage and cold chain logistics. In the past, the market mainly operated on vegetable trade and lacked technology specialists reserves and management experience in cold storage and cold chain logistics. When the project is completed, technology and management specialists need to be hired to ensure stable development of the market;

(vii) The market needs to enhance its delicacy management capacity. At present, the market, based on the total trade volume, charges 0.02yuan per kilo for commission fee as its main operation revenue. Due to lack of electric transaction log system, the market could not collect and analyze the transaction volume or price of each types of agricultural products at the grower side timely and systematically, thus could not provide accurate market information guidance for growers in the future; and

(viii) Local industrial chain can be further extended. Local vegetables are all sold fresh after rough cleaning and sorting with no further processing, constraining the further enhancement of the value of the end products.

D. Development Measures for the Value Chain

6. To deal with the above risks, Shanxi Xinjiang Wholesales Market of Vegetables should improve its operational and management capacities in the following aspects during the construction of the project,

(i) Establish and improve its transmission mechanism for transaction information. Xinjiang Wholesales Market of Vegetables should start to establish an information management system. Firstly, this system will help strengthen its
capacities in electronically collecting and analyzing transaction information by working with brokers at the market to track data and statistics of everyday transactions such as the type, quantity and price of each transaction so as to learn the changes in local market procurement demand. Secondly, this system will help better collecting and analyzing information on sales markets at other places, establish highly efficient information communication channel through internet or communication Apps on cellphones to pass information on market demand and prices to brokers, agricultural cooperatives and seedling farms at real time so as to enable them to learn about the changes on other markets;

(ii) Work with a third party to strengthen quality certification and traceability system. Working with government, quality inspection department or a third party specialized in product certification will help improve its quality inspection capacity and further expand their inspection range from quality inspection on end products to inspection on raw materials and inputs. In this way, the market will establish a product quality inspection platform of credibility. With the help of Internet of Things, information on the production date, batch, place of origin and circulation can be disclosed to the public and the product traceability system is gradually optimized;

(iii) Promote the establishment and regulate the development of vegetable agricultural cooperatives. Help growers become stronger and regulate the operation of grower cooperatives. In particular, agricultural cooperatives should make unified procurement of raw materials in line with demand and organize vegetable production. Agricultural cooperatives will serve as the middlemen between growers and brokers or wholesalers. Give trainings on production techniques to agricultural cooperatives as the basic unit, enhance their financial foundation so that in the future agricultural cooperatives can better support their members financially and provide financial guarantee to improve their production conditions;

(iv) Make gradual extension of the processing section in the industrial chain to increase product value. In compliance with stricter quality certification (pollution-free, green and organic), the market should step by step extend the processing line by working with food processing companies so that local vegetables can be upgraded to vegetables of well-known brands, which will surely bring more income to both growers and processing companies;

(v) Optimize the service function of the market as a platform and get access more sales channels. While increasing the vegetable transaction volume year by year, Xinjiang Wholesales Market of Vegetables should find more sales channels in addition to local brokers and establish contacts with some well-known food processing companies. By passing on the demand to brokers or vegetable growers, it will help promote contract farming;

(vi) Provide supportive financing service. Firstly, the market should effectively promote regulated operation of agricultural cooperatives, then introduce competent agricultural cooperatives to banks by providing transaction information of the agricultural cooperatives to the bank to support the loan
assessments so that growers may get financial support needed for their production and lives. Secondly, after the cold storage and cold chain logistics are built, the market should work with banks to innovate in mortgage financing to solve financing problems encountered in vegetable transactions;

(vii) Select technology and management specialists. The first approach is to join production and trade associations and industrial societies to enhance information communication and learning capabilities and help the management staff improve their managerial skills through multi-level trainings. The second approach is to organize standardized technology training to workers at cold storage and cold chain logistics and promote managers with related experience; and

(viii) Strengthen technical guidance to production to help growers improve production efficiency and effects. Apart from getting help from government agro-technique extension staff, Xinjiang Wholesales Market of Vegetables should also organize specialized companies such as drip irrigation equipment manufacturers, night soil suppliers, seed-breeding companies and agricultural technical service companies to meet with local vegetable growers, jointly setting up demonstration production base. This will drive other growers in the area to enhance their production capacity and thus bring in core competitive advantage for local vegetable growers.

E. Action Plan Schedule

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Action Plan</th>
<th>Steps</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Establish and improve its transmission mechanism for transaction information</td>
<td>1. Strengthen electronically collecting and analyzing local transaction information</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Strengthen data collection and analysis on sales markets at other places</td>
<td>Short-term</td>
</tr>
<tr>
<td>2</td>
<td>Work with a third party to strengthen quality certification and traceability system</td>
<td>1. Establish better quality certification system</td>
<td>Long-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Establish product traceability system</td>
<td>Long-term</td>
</tr>
<tr>
<td>3</td>
<td>Promote and regulate the establishment of vegetable grower cooperatives and its orderly development in steps</td>
<td>1. Guide the establishment of agricultural cooperatives</td>
<td>Medium-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Regulate the operation of agricultural cooperatives</td>
<td>Long-term</td>
</tr>
<tr>
<td>4</td>
<td>Make gradual extension of the processing section of the industrial chain to increase product value</td>
<td>1. Gradually extend product deep processing chain to improve product added values.</td>
<td>Long-term</td>
</tr>
<tr>
<td>Serial No.</td>
<td>Action Plan</td>
<td>Steps</td>
<td>Duration</td>
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<tr>
<td>5</td>
<td>Optimize the service function of the market as a platform and get access to more sales channels</td>
<td>1. Explore more sales channels in steps to promote contract farming</td>
<td>Medium and long-term</td>
</tr>
<tr>
<td>6</td>
<td>Provide supportive financing service</td>
<td>1. Promote cooperation between agricultural cooperatives, banks and markets to solve growers’ financing problems</td>
<td>Long-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Use cold storage and cold chain logistics to develop financing products for supply chain to solve financing problems in trade</td>
<td>Long-term</td>
</tr>
<tr>
<td>7</td>
<td>Select technology and management specialists</td>
<td>1. Join production and trade associations and industrial societies to enhance information communication and learning capabilities and help the management staff improve their managerial skills through multi-level trainings</td>
<td>Medium and long-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Organize standardized technical training to workers at cold storage and cold chain logistics and promote managers with related experience</td>
<td>Medium and long-term</td>
</tr>
<tr>
<td>8</td>
<td>Strengthen technical guidance to production to help growers improve production efficiency and effects</td>
<td>1. Organize external technical companies to work with growers.</td>
<td>Short-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Set up demonstration bases to stimulate growers to improve their production capacity</td>
<td>Medium and long-term</td>
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</tbody>
</table>

Note: Short-term: 3-6 months; Medium-term: 6-12 months; Long-term: more than 12 months.
APPENDIX 3: ACTION PLAN FOR VALUE CHAIN DEVELOPMENT OF SHANXI KAISHENG FERTILIZER GROUP CO. LTD.

A. Industrial Chain

1. The project invests the plant industry which is focused on P.eryngii mushroom production. In terms of the product attribute and market demand, there is a fast growing mushroom market in China. There is still a big market supply gap in the Yuncheng region. In terms of the industrial chain, the current mushroom industrial chain in China is just composed of few parts due to lack of fine processing of mushroom. Because the development of mushroom strain requires high level technical reserves and plenty of investment, however, there are just moderate levels of market competition. The core enterprises that master technical resources can develop their own strains, and they just collaborate with their upstream enterprises for mushroom packages or simply purchase raw materials from the farmers. Given the mushroom production need constant human labor, the mushroom enterprises generally adopt an approach combining of “the company and farmers” to produce the mushroom. The downstream of the industrial chain mainly includes distributors and mushroom processing manufacturers.

2. The Shanxi Kaisheng Fertilizer Group company has been producing organic fertilizer for many years, and it has reserved high levels of techniques and production facilities. The company started to build production facilities of P.eryngii mushroom in 2014 and formally put into production of mushroom in 2016. The current production chain includes strain development, the production of fungi stick, the production of P.eryngii mushroom, and purchasing and selling of P.eryngii mushroom. In terms of the current business model, the upstream and downstream in the industrial chain of the Kaisheng Fertilizer Group company includes the following parts.

(i) Raw material producers: corn farmers, fruit tree farmers and fungi stick packaging company;

(ii) Distributors: primary distributors inside and outside the Shanxi province.

B. Distribution of the poultry value chain and its development

3. The original business model of the Kaisheng company includes employed farmers. However, the new project strengthens the cooperation partnership with the farmers and further brings in more income for the employed farmers. Compared with the existing business model, the new business model increases the comprehensive income. The changes in the prices and gross profit are shown in detail below.

(i) The farmers who rent the greenhouses can obtain a gross profit of 1.6 yuan/kg, and correspondingly the Kaisheng company obtains a gross profit of 2.6
yuan/kg which is increased from the original 2.4 yuan/kg. The result shows that the new project brings mutual benefit to farmers and the company itself.

(ii) The newly built greenhouses can produce the P.eryngii mushroom with a volume of 6.5 million kilograms, the total income of all parties involved in the value chain are increased. Though some parties involved in the value chain get a decrease in the gross profit ratio, there is still an increase in the total gross profit as a whole.
(iii) The new built greenhouses bring an increase in the total sales revenue of all parties involved in the value chain. The changes are shown below. (Renminbi, million yuan)
C. The value chain development and main risks

4. The Kaisheng Fertilizer Group Company covers all parts of the value chain from the production to product sales. Under the original business model, farmers are employed to take part in the P.eryngii mushroom production and obtain the salary based on the amount of labor and performance. On one hand, this business model can conduct the centralized production and ensure the product quality through the quality control measures; on the other hand, the farmers are managed as the employees and trained with a certain corresponding production skills to reduce the cost of technical export. However, there is a limited space for the farmers to grow and increase their production efficiency.

5. In the new project, the company will lend the greenhouses to the farmers to plant the P.eryngii mushrooms. By doing so, the company can establish a much complex relationship with the farmers, improve the farmers’ enthusiasm for production, and further achieve the inclusive goal of bringing in more income for the farmers and the company itself. Based on the analysis of the value chain, the project will pay more attentions on the following issues.
Strengthen the ability of the company to control the value chain. The Kaisheng company as a core enterprise integrates all parts of the value chain except the production of raw materials and product distribution. Though the high integration ensures the control of product quality and the demands for the scaled production, it inevitably creates giant demands for investment on the whole value chain and centralized risk from all parts of the value chain, such as the insured buy-back contract between the company and the farmers which protects the farmers but transfers the market risks to the company itself. Therefore, it is important for the company to constantly improve its ability to identify market risks;

Improve the efficiency of communication between the company and the end of the value chain. Because the Kaisheng company does not connect the consumer market directly and the response to market demands highly depends on the feedback from the distributors, the company has to get an effective and efficient communication with the end of the value chain to clearly know specific demands of the consumers for the types of products, quality standards, etc., and to transform these demands to the production requirements;

Control the management cost of the farmers. Because some parts of the value chain like the purchasing of raw materials, production and selling of P.eryngii mushroom need to be well organized by the core company (i.e., Kaisheng), and 130 newly built greenhouses for mushroom require around 100 farmers to plant, the company has to spend more money in the communication with the farmers and management, and the company need to encourage the farmers to improve the organization level and to reduce the transaction cost with the company;

Pay more attention on the growing cash flow pressure. Due to the high-level integration of the value chain, the working capital requirement for only 130 greenhouses is at least 10 million yuan. Because the current loans of the company are short-term loans, these loans did not match the timeline of the parties in the value chain, creating a much greater cash flow pressure at some specific time points;

Expand the distribution channels. Previously the Kaisheng company primarily produced the fertilizers. Since 2016, the company started producing the P.eryngii mushroom and achieved the great results. So far, the company has only 7-8 distributors. After the new greenhouses are put into operation, the increasing production scale requires more wide distribution channels to maintain a steady market share in the future;

Develop more types of products and add more additional values to terminal products. The current products are mainly consisted of fresh mushrooms. The fresh products have low additional values, so the company will develop more types of deep processing products to obtain more profits; and

Strengthen the production efficiency of the farmers constantly. Compared to the farmers in other regions, the quality of the mushrooms produced in the rent greenhouses is guaranteed well. However, the rent also led to an increase in
the production cost. So, the company has to enhance the technical training of the farmers to improve the quality and increase the quantity of the products, aiming at increase the ability to compete with other products in the market.

D. Measures of value chain development

6. In response to these risks above, the Kaisheng Fertilizer Group company will take the following measures to prevent the risks in the project.

(i) Promote the establishment and integrated development of the Farmers Planting Cooperative gradually. The company will screen the farmers who have a lot of experience of planting and high efficiency, and then help them establish an integrated Farmers Planting Cooperative to grow the mushrooms. By helping the Farmers’ Professional Cooperative to promote their ability to operate independently and be managed correctly, the company can reduce the management cost of farmers, improve the farmers’ enthusiasm for production, make the farmers cooperatives to be an entity with the ability to obtain a bank loan, and reduce the occupy of operating funds due to the payment in advance for the raw materials. The establishment of the farmers planting cooperative also provide the opportunities for the farmers to grow their own business;

(ii) Enhance the technical support and improve the production efficiency. The company will enhance the technical support for the farmers who rent the new greenhouses to improve the production efficiency and reduce the production unit cost gradually. At the same time, the company will control the product quality more strictly to combine the efforts of both the farmers and the company to improve the Kaisheng brand value together leading to bring in more profits for the company and the farmers;

(iii) Expand the processing parts of the value chain and increase the value of terminal products. After the new project is put into operation, in addition to maintain the existing distribution channels, the company will explore deep processing techniques to develop various mushroom products such as mushroom powders, mushroom sauces, mushroom can, mushroom dressing, mushroom cookies, and so on, to expand the market channels and to add additional values to the products;

(iv) Establish the good cooperative partnership with financial institutions. Firstly, the company will optimize the operation and financial performance, put the focus on the core business sectors and maintain the good existing cooperative partnership with financial institutions in terms of cash flow and loan. Secondly, the company will strengthen the financial management and information disclosure, explore the opportunities to collaborate with the non-financial institutions such as leasing agencies, factoring, insurance, industrial investment fund, etc.;

(v) Improve the incentive-restraint mechanism of farmers. Compared to the previous workers, the farmers who rent the greenhouses have much higher enthusiasm for production. The company will establish and improve the operating procedures for growing the mushrooms and performance evaluation
Furthermore, through the technical training at all levels, the company will encourage the farmers to constantly improve the production efficiency and production standards to provide more profit for those excellent farmers; and establish a much closer relationship with the farmers to provide them a broader space to grow. Based on the highly effective Farmers Planting Cooperatives or scale operation, the prices of raw materials and finished products will be liberalized to let farmers take participation in the market to get more opportunities to grow their business. At the same time, the liberalization of the prices will also reduce the risks of the company.

E. Action Plan Steps and Schedule

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<th>Serial Number</th>
<th>Action Plan</th>
<th>Steps</th>
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</table>
| 1             | Promote the establishment and integrated development of the Farmers' Planting Cooperative Gradually | 1. Screen the farmers who have a lot of experience of planting and high efficiency and help them establish an integrated Farmers Planting Cooperative.  
2. Collaborate with several professional institutes to enhance the capacity of the Farmers Planting Cooperative. | Mid-term, Long-term |
| 2             | Enhance the technical support and improve the production efficiency         | 1. Enhance the technical support for the farmers who rent the new greenhouses to improve the production efficiency and reduce the production unit cost gradually. | Long-term      |
| 3             | Expand the processing parts of the value chain and increase the value of terminal products | 1. Develop the deep processing products and increase the additional value of products | Long-term      |
| 4             | Establish the good cooperative partnership with financial institutions     | 1. Optimize the operation and financial performance, focused on the main business sectors, maintain the good existing cooperative partnership with financial institutions in terms of cash flow and loan  
2. Strengthen the financial management and information disclosure, explore the opportunities to collaborate with the non-financial institutions such as leasing agencies, factoring, insurance, industrial investment fund, etc. | Short-term, Mid-term, Long-term |
| 5             | Improve the incentive - restraint mechanism of farmers                     | 1. Establish and improve the operating procedures and performance evaluation  
2. Strengthen the technical training at all levels | Short-term, Mid-term, Long-term |
<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Action Plan</th>
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<tbody>
<tr>
<td>6</td>
<td>Establish a much closer relationship with the farmers to provide them a broader space to grow</td>
<td>1. Based on the highly effective Farmers Planting Cooperatives or scale operation, liberalize prices of raw materials and finished products to let farmers take participation in the market to get more opportunities to grow their business</td>
<td>Long-term</td>
</tr>
</tbody>
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Note: Short-term: 3-6 months; Mid-term: 6-12 months; Long-term: more than 12 months.
APPENDIX 4: ACTION PLAN FOR VALUE CHAIN DEVELOPMENT OF HONGCHANG ANIMAL HUSBANDRY CO., LTD.

A. Industrial Chain

1. The project invests the poultry industry which is focused on white-feather broiler production. In terms of the product attribute and market demand, white-feather broiler is relatively stable mass consumer goods. In terms of the industrial chain, white-feather broilers industry has a rich industrial chain which includes a plenty of upstream manufacturers of poultry feeds and poultry medicines, and upstream animal husbandries and hatcheries that can provide primary breeders, grandparent stock, parent stock, etc; and the downstream of the industrial trains are local meat slaughter and processing firms, cold storage services and distributors.

2. The business scope of Hongchang Animal Husbandry Co., Ltd., includes feed manufacturing, broiler breeding, meat slaughter and processing operation. There are two subsidiaries and one farmer professional cooperative, i.e., Chaoyang Farmer Professional cooperative, Chaoyang Food Company and Chaoyang Feed Manufacturer.
   (i) Feed manufacturer: farmers, feed raw materials formula manufacturer, logistics;
   (ii) Chicken supplier: commercial chicken incubator, logistics;
   (iii) Poultry medicine and vaccines: poultry medicine and vaccines manufacturer;
   (iv) Broiler production: poultry farmers; and
   (v) Distribution: main distributors inside and outside the Shanxi province.

B. Distribution of the poultry value chain and its development

3. Because the interview is only focused on part of the value chain, such as feed manufacturing and product sales, it is hard to know the overall information of the whole value chain. Therefore, we drew the conclusions based on the value chain analysis model consisting of several factors, such as gross profit margin, gross profit ratio and changes in gross income.
   (i) The investment plan is to build a new demonstration broiler farm, by which Hongchang Animal Husbandry Co., Ltd., is planning to help poultry farmers to improve the overall production level. However, the goal of the project is hard to be achieved in the short term. So, the project had no influence on the gross income and the price of poultry products sold by all parties involved in the company’s value chain over a short period of time. The gross income and the price of poultry products sold by all parties involved in the company’s value chain are shown below (Renminbi, Yuan).
Because the Chaoyang Farmer Professional cooperative had signed the insured contract with poultry farmers to purchase the broilers at a higher price, and they sold the broilers to the Chaoyang Food company at a lower real market price, it led to a fact that the Chaoyang Farmer Professional cooperative incurred a net loss in the broiler trade. Though the Chaoyang Farmer Professional cooperative could make a certain amount of profit by selling the chickens, feed and poultry medicines to farmers, the profits as a whole could not cover the operating loss. The newly built demonstration poultry farm did not affect the gross income ratio of all parties involved in the company’s value chain in the short term.

(iii) All parties involved in the company’s value chain had an increase in the gross income after the investment, such as the production inputs and trade volume of the Chaoyang Farmer Professional cooperative, the breeding number and sales of the broiler farm, the volume of meat processing and sales of the Chaoyang Food company. The changes in the gross income of all parties involved in the company’s value chain are shown below (Renminbi, Yuan).
C. The value chain development and main risks

4. Hongchang Animal Husbandry company plays a key role in the value chain assuming the responsibility for a core enterprise. On one hand, Hongchang Animal Husbandry company has established excellent business connections among various upstream and downstream suppliers and distributors, taking full use of local raw materials and labor sources to form its own advantages. On the other hand, by adopting the approach of combining the company and farmers, Hongchang Animal Husbandry Co., Ltd has organized more than 280 farmers to be engaged in a business breeding broiler chickens. Hongchang Animal Husbandry Co., Ltd not only bought on credit the farmers chickens, feed, poultry medicine and other materials, but also signed the buy-back contract with a guaranteed profit and various free technical supports. These greatly reduce barriers for farmers to breed broilers, lead the poor farmers better off and enhance the social and economic benefits.

5. In this project, Hongchang Animal Husbandry Co., Ltd is planning to build two standardized broiler farms, and adopted a "standardized demonstration base" model in which high-level standardized broiler farms were build and operated by the enterprises as a technical training and demonstration program for other poultry farmers to improve the local broiler breeding techniques and increase the farmers’ income. From the perspective of value chain development, there are some risks associated with the project, as shown below.

(i) Impact of price fluctuation of production inputs such as chickens and feed on the enterprise operating profit. Because the company has signed the fixed-price sales contracts for chickens and feed, the company will lose money when the prices of chickens and feed are rising. For example, in 2016, there was greater chicken price volatility with the lowest price of 0.5 yuan per chicken and the highest price of 3.8 yuan per chicken. With the expansion of the breeding scale, price fluctuation of raw materials will impose an impact on the profit;

(ii) Financial pressures on the enterprises. Under the current collaborative condition, the company needs to buy production materials, such as the chickens, feed and poultry medicines, etc. Though the company collected at least 5 yuan per chicken as a security deposit from the farmers to be used as
cash flow, the company still needed to pay out production fund of 25,000,000 yuan in advance annually to maintain the broiler breeding. At the same time, after the broiler farm with a capacity of producing 200 million broilers is finished and put into operation, the company needed an extra 78,700,000 yuan to be used as advanced working capital. Furthermore, with the expansion of the breeding scale, the upstream feed manufacturer, which has been bought by Hongchang Animal Husbandry Co., Ltd., also needed an extra 37,900,000 yuan to be used as advanced working capital. Therefore, the rising demands for the funds will create a bigger pressure on the company;

(iii) Need to improve the production efficiency. There is still a certain optimization space for Hongchang Animal Husbandry Co., Ltd., and the cooperative farmers to increase the breeding performance. For example, the current average meat to feed ratio is 1.72, and the average survival rate is 95%; in comparison with the modernized broiler farms in other regions in China, the average meat to feed ratio is bigger by 0.1 and the average survival rate is lower by 3%. In this project, Hongchang Animal Husbandry company will build a new modernized broiler farm as a demonstration broiler farm with greatly improved facilities. However, the farmers’ techniques and management level still had a potential impact on the production efficiency. Furthermore, it is still unknown whether the demonstration base would play a positive role in leading other farmers;

(iv) Labor costs in the slaughter and meat processing could be decreased. At present, the company hired nearly 800 workers to conduct the feed manufacturing, breeding management and food processing. Among them, the broiler production line with a capacity of producing 50,000 broilers needs more than 400 workers, so the automation of farm production and slaughter and meat processing workshop needed to be improved to prevent the rising cost due to the labor;

(v) Need to improve the breeding plan to reduce the production risk and to meet the market demands better. Currently, there are various broilers with different ages in every breeding region, which is not good for disease protection. In addition, due to different strains of the chickens, the mixed feeding to male and female broilers, it needs to distinguish the optimized feed and production methods;

(vi) Strengthen the linkage between production and sale information. The main products of Hongchang Animal Husbandry company are plenty of frozen chicken, which are sold by 10-15 distributors. The transmission of marketing information heavily depends on the disturbers above, which creates the risk of slow transmission of marketing information and inaccuracy;

(vii) Impact of low-level organization of poultry farmers on the scale expansion and cost control. Currently, the farmer cooperatives do not have the ability to operate independently and manage financially, and they cannot apply the loan from the bank as a legal entity to help its members expand their production, suppress their ability to enlarge the farms or improve the production condition. On the other hand, due to the lack of a unified organization, the company has
to spend more money in communication and management, such as technical training and order management, etc. Thirdly, the unorganized farmers do not have the ability enough to negotiate the price when they are dealing with the company, which is unfavorable for the long-term benefits of the farmers;

(viii) The exit of low-performance farmers. Due to the continuous improvement of the demonstration base and production efficiency of the cooperative farmers, the supply volume of broilers is increasing accordingly. Therefore, some farmers whose products cannot meet the requirements will be fired. The company needs to figure out the ways to help them re-build or transfer their basic equipments to others based on the actual situation, to avoid that the farmers get poorer before they can get back their investment due to the sudden termination of the collaboration; and

(ix) Further improvement of quality certification and traceability system. Hongchang Animal Husbandry company has passed QS certification system and HACCP certification system. To enter into the higher end of the broiler market, the company needs to further collaborate with the third party which is accepted by the consumers to strength the quality control and improve the brand value.

D. Measures of value chain development

6. In response to these risks above, Hongchang Animal Husbandry company will take the following measures.

(i) Promote the establishment and integrated development of the Farmers’ Professional Cooperative gradually. By helping the Farmers’ Professional Cooperative to promote their ability to operate independently and be managed correctly, the company can reduce the management cost of farmers, improve the farmers’ enthusiasm for production, make the farmers cooperatives to be an entity with the ability to obtain a bank loan, and reduce the occupy of operating funds due to the payment in advance for the raw materials;

(ii) Improve the overall production efficiency of broiler breeding. Through benchmarking. The company will find the reasons for the low production efficiency, such as production condition, feed formula, breeding techniques, etc., to improve the production efficiency and reduce the production cost. The company will provide more technical services for farmers, especially for those high-performance farmers, and provide the guidance for them to analyze the results of each batch, and establish the performance evaluation model of poultry farmers and tracking card which can show the potential of the future breeding (meat to feed ratio, growth status, slaughter weight, mortality, etc);

(iii) Improve the breeding plan. By analyzing the products, the company will find the strain of broiler which meets most the market demand, and further study the production features to improve the professional production. At the same time, the company will organize the rational schedule of bringing in the chickens and right batches to avoid the risk of infection;

(iv) Improve the production efficiency of slaughter and meat processing. The company will gradually improve the automatic level of slaughter and meat
processing and reduce the labor use to reduce the labor cost in the future and to increase production efficiency and standardization;

(v) Join the product certification and traceability system, and strengthen the brand value. Though the broilers are among a large quantity of consumer goods, joining much stricter product certification system is a prerequisite to enter into the higher end of the poultry market. The company will collaborate with the third party to join the product certification and traceability system to establish and strengthen the own brand value to get more revenue;

(vi) Expand distribution channels and deepen the linkages with the terminal consumer market. In the premise of ensuring the steady improvement in quality, the company will reinforce the sales force. Firstly, the company will increase the number of buyers. Besides maintaining the original 10-15 wholesaler, the company will build the collaborative partnership with wholesale markets and the restaurant chains in other places. Secondly, the company will attempt to develop the products gradually that meet the terminal consumer market demands, such as the chilled products and seasoning ingredients, to reduce the dependence on the wholesalers and improve marketing efficiency and accuracy;

(vii) Manage well the entry and exit of cooperative farmers. Firstly, the company will encourage the farmers who have a certain ability to invest and master the breeding techniques to take a stake in the new poultry farm to achieve the goal to share in the profits and losses through equity association. Secondly, for those farmers who are difficult to maintain the cooperative partnership, the company will help them to transfer production facilities and to be employed by other efficient farmers to avoid the investment loss and to reduce the impact on their personal lives;

(viii) Expand external sources of technology. The company will enhance the training of the technicians and employ high-level talents in poultry breeding. In addition to continue to collaborate with agricultural institutes to get technical supports, the company will actively take part in various industrial association, forums and the exchange events to deepen the understanding of techniques, products and markets and further constantly update the knowledge and acquire new skills;

(ix) Improve the ability to raise capital. The project needs a total investment of 452,644,000 yuan, in which a loan of 288,000,000 yuan is offered by the Asian Development Bank and the rest of 164,600,000 yuan is self-raised by Hongchang Animal Husbandry Co., Ltd. Combination with the operation and the payment in advance for the production materials, there is a big financial pressure on the company. The company will improve their own financial management and disclosure effectiveness, deepen the cooperation with various financial institutions, and make sure to maintain financial stability for sustainable business development;

(x) Help the farmers and farmer professional cooperatives to get bank financing. The improvement of the production efficiency of the farmers and the farmer cooperatives highly replies on the continuous investment on the techniques
and equipment. Under the current situation in which unorganized farmers are hard to get the bank loan, the company will promote the three-party collaboration among the enterprises, farmers (or farmers cooperatives) and banks, and provide the external guarantee for farmers or farmers cooperatives to apply the loan from the banks. The company will deduct the corresponding interest of the loan from the settlement amount of broilers sold by the farmers. Through the supply chain finance, the farmers or farmer cooperatives can get the loan from the bank;

(xii) Strengthen the relationship between the farmer's income and the performance. Besides the broiler production index used in Europe, the company will add other production indexes (such as broiler quantity per square meters or chicken weigh per square meters) to correlate the farmer's income with the performance to a greater extent to encourage farmers to continuously improve the production techniques; and

(xii) Adjust approaches to collaborate with the farmers gradually. The current insured purchasing price can effectively avoid the impact of price fluctuation in the market on the farmers. However, the market risk falls primarily on by the Hongchang Animal Husbandry company. In the future when the farmer cooperatives are managed and operated efficiently. The purchasing price should be liberalized gradually to let farmers take participation in the market to get more opportunities to grow their business and simultaneously reduce the operational risk of the company.

E. Action Plan Steps and Schedule

<table>
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<th>Serial Number</th>
<th>Action Plan</th>
<th>Steps</th>
<th>Schedule</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Promote the establishment and integrated development of the Farmers’ Professional Cooperative Gradually</td>
<td>1. Help the Farmers’ Professional Cooperative to promote the capacity development to make it to be an entity with the ability to operate independently and be managed correctly</td>
<td>Long-term</td>
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<td></td>
<td>2. Promote the cooperation between the Farmers’ Professional Cooperatives to form a cooperative partnership to share in the profits and losses of the business</td>
<td>Long-term</td>
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<tr>
<td>2</td>
<td>Improve the overall efficiency to breed the broilers</td>
<td>1. Establish the performance evaluation model of poultry farmers and tracking card to know the changes in the performance of poultry farmers</td>
<td>Short-term</td>
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<td>2. Help poultry farmers to find the reasons why the breeding efficiency was restricted and the quality is stalled.</td>
<td>Mid-term, Long-term</td>
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<td>3. Help poultry farmers to improve the breeding techniques and equipment</td>
<td>Long-term</td>
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<tr>
<td>3</td>
<td>Improve the breeding plan</td>
<td>1. Organize the rational schedule of bringing in the chickens and right batches to avoid the risk of infection</td>
<td>Short-term</td>
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<td></td>
<td></td>
<td>2. Find the strain of broilers which meets the market demand and further study the production features to improve the professional production</td>
<td>Long-term</td>
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<tr>
<td>4</td>
<td>Improve the efficiency of slaughter and meat processing</td>
<td>1. Improve the automatic level of slaughter and meat processing, reduce the human labor and increase production efficiency and standardization</td>
<td>Long-term</td>
</tr>
<tr>
<td>5</td>
<td>Join the product certification and traceability system, strengthen the brand value</td>
<td>1. By cooperating with the third party to join the product certification and traceability system, establish and strengthen the own brand value to get more revenue</td>
<td>Mid-term, Long-term</td>
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<tr>
<td>6</td>
<td>Expand distribution channels and deepen the linkages with the terminal consumer market</td>
<td>1. Increase the number of buyers besides the original 10-15 wholesalers to maintain original 10-15 wholesalers, increase the number of buyers to build the collaborative partnership with wholesale markets and the restaurant chains in other places</td>
<td>Mid-term, Long-term</td>
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<tr>
<td></td>
<td></td>
<td>2. Attempt to develop the products gradually that meet the terminal consumer market demands, such as the chilled products and seasoning ingredients, to reduce the dependence on the wholesalers and improve marketing efficiency and accuracy</td>
<td>Long-term</td>
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<tr>
<td>7</td>
<td>Manage well the entry and exit of cooperative farmers</td>
<td>1. Encourage the farmers who have a certain ability to invest and master the breeding techniques to take a stake in the new poultry farm to achieve the goal to share in the profits and losses through equity association</td>
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<td></td>
<td></td>
<td>2. For those farmers who are difficult to maintain the cooperative partnership, help them to transfer production facilities and to be employed by other efficient farmers to avoid the investment loss and to reduce the impact on their personal lives.</td>
<td>Mid-term, Long-term</td>
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<tr>
<td>8</td>
<td>Expand external sources of technology</td>
<td>1. Enhance the training of the technicians and employ high-level talents in poultry breeding</td>
<td>Mid-term, Long-term</td>
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<tr>
<td></td>
<td></td>
<td>2. Strength exchanges between various industries, deepen the understanding of techniques, products and markets and further constantly update the knowledge and acquire new skills</td>
<td>Mid-term, Long-term</td>
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<tr>
<td>9</td>
<td>Improve the ability to raise capital</td>
<td>1. improve their own financial management and disclosure effectiveness, deepen the cooperation with various financial institutions, make sure to maintain financial stability for sustainable business development</td>
<td>Mid-term, Long-term</td>
</tr>
<tr>
<td>10</td>
<td>Help the farmers and farmers professional cooperatives to get bank financing</td>
<td>1. Promote the three-party collaboration among the enterprises, farmers (or farmers cooperatives) and banks to meet the financial needs of farmers through supply chain finance</td>
<td>Mid-term, Long-term</td>
</tr>
<tr>
<td>11</td>
<td>Strengthen the relationship between the farmer’s income and the performance</td>
<td>1. Extend the evaluation index system to correlate the farmers’ income with their performance</td>
<td>Short-term</td>
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<tr>
<td>12</td>
<td>Adjust approaches to collaborate with the farmers gradually</td>
<td>1. Liberalize prices of raw materials and finished products to let farmers take participation in the market to get more opportunities to grow their business and simultaneously reduce the operational risk</td>
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Note: Short-term: 3-6 months; Midterm: 6-12 months; Long-term: more than 12 months.