

Research on the Application of Value-Added Objective Management of Industrial Chain in Agricultural Enterprises

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Abstract

Small farms in China can increase income and profitability by focusing on value-added procedures and direct selling. This study presents a survey on the value-added management of the industrial chain in agricultural enterprises in China. This analysis provides an efficient approach for building the China value chain model. As a first step, significant roadblocks to value chain improvements, such as limited access to markets and underfunded facilities, are recognized. This study helps to identify the difficulties in diversifying the agricultural business models in China. The alternatives for updating value addition in agricultural enterprises are assessed in this paper. A brief explanation of alternative strategies for value-added management, such as Price monopoly, contract farming, and vertical industrial chain management, are provided in this study. These are some of the improvement approaches for agricultural chain management and development. To enhance agricultural production in rural areas, alternative strategies for value-added management must be continuously enhanced, upgraded, and propagated.

Keywords- Agriculture enterprise, Value-Addition, Value Chain, Vertical Chain-Network, Industry Chain

I. Introduction

The agricultural value chain is a complicated system that manages the flow of agricultural goods from the point of production to the point of consumption in the market. High-value-adding industrial chains in agriculture are networks of agricultural firms that carry goods from production to usage while adding value to the market. To fulfill customer demand for agri-food goods and to ensure product quality and safety, value chain members play a significant role in the circulation process. Coordination of producers and communities based on social demands for the development of farmer organization, production, and handling

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technologies is included in this framework. To ensure that agricultural goods fulfill the needs of consumers and preserve their quality and safety, agricultural resources are an essential part of the supply chain. Figure 1 depicts the framework of the agricultural value chain.

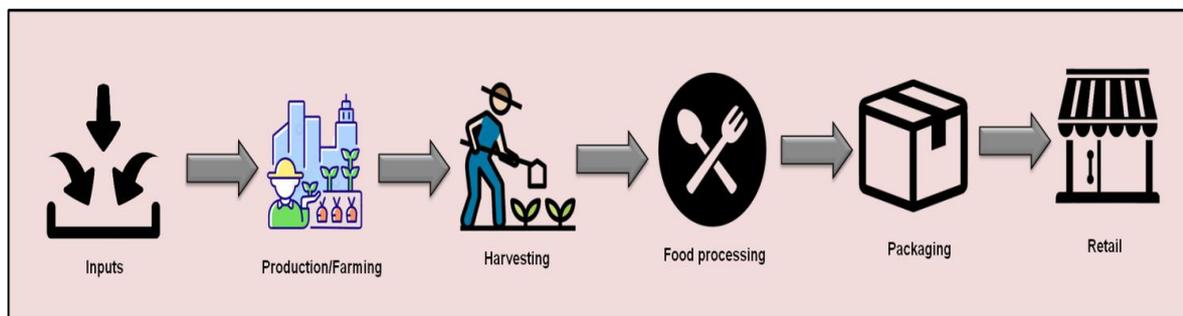


Figure 1: *Agricultural value chain*

It is the primary goal of a value chain to develop value-added goods or services for a target market by changing resources and using infrastructures. Companies in the food and agribusiness industry are increasingly looking to engage smallholders in high-value supply chains to assure the long-term supply of agricultural products, such as cocoa, coffee, and so on. Maintaining a competitive advantage in the expanding global food market while promoting smallholder livelihoods and rural economic development is the goal of agri-business. There are now about 2,30,000 agricultural businesses in China, the majority of which are small and medium-sized companies (Leng et al. 2018). Even if China's urbanization rate reaches 60% or even higher, there will still be about 500–600 million people living in the vast rural regions, supplying agricultural-related goods and services to 1.4–1.5 billion people (Li et al. 2019).

As a way to optimize the agricultural sector as a whole, industrial value chain management refers to the method of management in which the industry's core companies take the lead and each participant works closely together to integrate and develop every link throughout the whole industrial value chain. Farmers' income and rural economic development may be boosted by increasing agricultural product value-added. To guarantee that the supply of sustainable, cheap, safe, and adequate food, feed, fiber, and fuel to consumers is maintained via the use of new internet technologies, the agri-food value chain is of crucial significance (Zhao et al. 2019). Food production is a major priority of the United Nations' Sustainable Development Goals, which necessitates innovation and investments (Zhang et al. 2020). Another benefit of maximizing agricultural product circulation value chain optimization is that it facilitates coordination of agricultural product production and operation, as well as an increase in agricultural product circulation's technological advancements (Garg 2020). Initially, this paper discusses the constraints for value chain development in the agricultural sector in China. Further, technological transformations in the traditional agricultural system and agricultural product circulation are also depicted in this paper.

Ii. Constraints in Agricultural Value Chain Management

The constraints for value chain development and management in agricultural business are access to market, availability of resources and physical infrastructures, access to agronomy information, and access to institutional finance. The major challenge in this process is how to increase farmers' participation in the process of adding value to their products. Figure 2 depicts difficulties in agricultural value chain management and some of the agricultural reforms to upgrade the agricultural business.

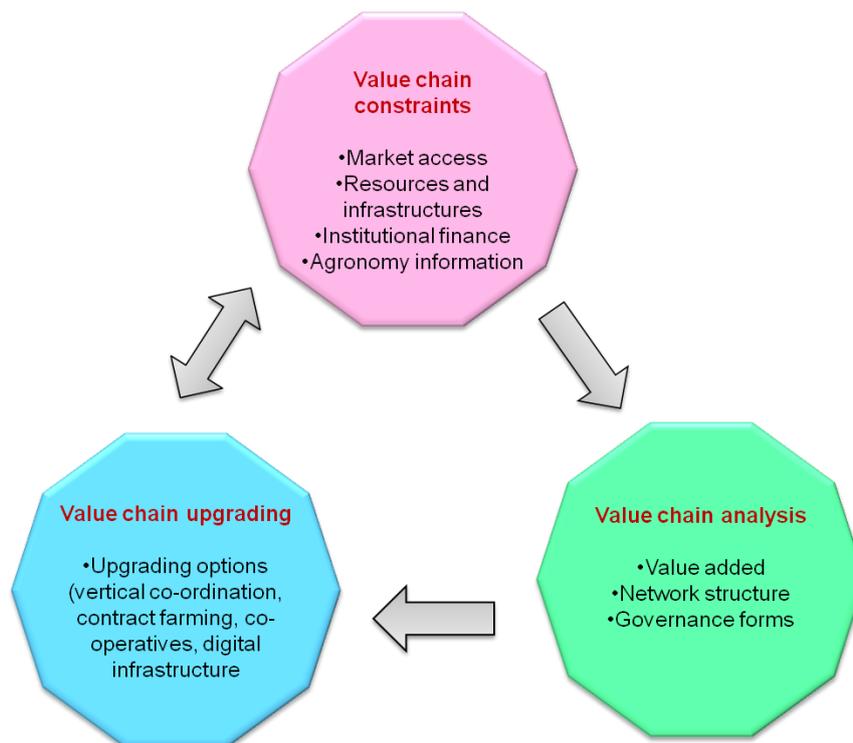


Figure 2: Framework of Agricultural value chain analysis

Access to High-value Market

For the impoverished in rural regions to profit from agricultural prosperity, they need easy access to markets. Smallholder farmers have a difficult time competing in high-value marketplaces. It may be simple to enter the market, but it is far more difficult to maintain one's place inside the industry. As a result of globalization, smallholder farmers have been able to produce more high-value crops. But the process of agro industrialization, globalization, and market integration may remove these farmers from high-value markets. Smallholder farmers need to produce high-value commodities to participate in agribusiness value chains and access high-value markets. For small-scale farmers in rural regions, transaction costs tend to be higher in the production and distribution of high-value-added goods. In the case of high-value-added goods, small-scale farmers are more likely to be excluded from participating in high-value marketplaces because of high transaction costs (Hao et al. 2018). Smallholder farmers have a huge problem in participating in high-value marketplaces unless an enabling environment can be created.

Access to Institutional Finance

One of the biggest obstacles to modernizing small-scale farming is the lack of financial resources. Farmers in China have very little access to institutional financing. Only 10% of farm families in China get loans from commercial banks and other financial institutions on average. For smallholders, these percentages are significantly less. Global population growth and a shift in middle-class eating habits toward higher-quality, higher-priced foods in developing nations are driving an increasing demand for agricultural goods, according to the World Bank. It is impossible to overstate the significance of providing financial support for agricultural goods. Seeds, fertilizers, insecticides, and agricultural equipment are often out of reach for smallholder farmers in China due to a lack of financial resources. The supply of agricultural goods and the chain's overall stability might be adversely impacted by this financial deficiency. The banking market is a classic technique for raising finances. The bank, on the other hand, views the smallholder farmer as a high-risk borrower due to his or her lack of creditworthiness and

significant collateral (Yi et al. 2021). If government involvement is not taken into consideration, bank funding is frequently unavailable or inefficient for the smallholder farmer to ease his financial stress.

Access to Agronomy information

Extension agents are usually used to disseminate research findings to farmers. Technology transfer in China's agriculture industry now depends heavily on the public sector (institutes and extension networks). It's still difficult to transfer information from the government, institutions, and schools to small-scale farmers (Jiao et al. 2019). Small and medium-sized farms have traditionally been unable to participate in high-value-added agriculture. This is because of the lack of trustworthiness of information about organic agri-products. It is very uncommon for farmers to be unable to get the information they need from extension workers in China, even though there are over 860 000 of them. As a result, there is a mismatch between the high demand for agronomic expertise and the low supply provided by government agencies, research organizations, and universities. Farmers must be educated in the use of new technologies, and public sector agencies are pushed to provide a solution to the issue of "the last mile" technology diffusion. As a result, a combination of top-down and bottom-up techniques is urgently required to help China's smallholder farmers translate their understanding of sustainable intensification into action.

Availability of Resources

It is important to have a robust management system in place for all of the resources (water, land, infrastructure, labor, and capital) that make up the agricultural supply chain. Smallholder farmers' ability to take advantage of agricultural market possibilities is hindered by a lack of access to these resources, particularly in terms of the number of items exchanged and the quality and quantity of the products. Input materials for manufacturing and other input supplies (e.g. electricity and water) are in short supply, which inhibits value chain upgrading. Despite decades of water shortages, China's per capita water resource is just 2062 m³, which is less than a fifth of the global average (Fan et al. 2019). It was exacerbated by the lack of agricultural irrigation technology's long-term development, which led to a trend of large water usage and poor water efficiency. In China, a scarcity of agricultural labor has been created by the migration of employees from agricultural to non-agricultural industries (Lu and Xie 2018). Chinese farmers' management practices have been substantially changed by the introduction and growth of agricultural land-use rights transfer regulations. If a firm or its value chain is positioned far away from high-value markets, its competitive position may suffer as a result. Access to trained labor and knowledge is a prerequisite for value chain players to engage in creative activity. Another area is the degree and availability of technology that can be employed in the value chain for manufacturing and distribution.

Iii. Transformations in Agricultural Value Chain Management

Agricultural Modernization refers to the use of innovative equipment, scientific research, industrial systems, business practices, and management strategies to enhance the productivity, profitability, and global competitiveness of agriculture. The modernization of China's agricultural sector will have far-reaching effects on rural development, food safety, and international commerce. China's agricultural modernization program has placed a heavy emphasis on developing high-value supply chains and advanced agro-industrial firms. We can raise the chances of this technological revolution attaining social and environmental sustainability if more people are involved in agricultural innovation systems that are governed by responsible innovation principles (Li 2022). Several modern technologies are being

promoted as potential solutions to the problems related to food production and the agricultural value chain, such as the Internet of Things, artificial intelligence, robotics, big data, and drones (Rose et al. 2021). Agriculture value chain efforts are becoming more prevalent in China to support smallholder farmers and help them access bigger market interventions and provide a route to bettering their socio-economic well-being. In addition, it has a large theoretical and practical impact on contemporary agricultural growth and has the potential to produce staggering impacts toward the reduction of rural poverty after the age of the Industrial Revolution. Agriculture is rapidly modernizing, creating changing demand patterns, enabling new production techniques, and upgrading the marketing, supply, and distribution channels (Bhoosreddy and Mody, 1995). Most rising nations tend to become industrialized and increase their global market position as a result of the seamless transfer of agricultural value chains in modern agriculture. It was found that smallholder farmers in China's agricultural value chain had a positive impact on rural development and poverty reduction.

The major transformations required in the industrial chain of agriculture are listed below.

- From individual operations to co-operative operations
- From production for self-sufficiency to market-oriented production
- From staple agriculture products to high-value products
- From traditional chains to modern value chains
- From spot-market farming to contract farming
- From a focus on production output to a focus on commercialization
- From low-profit marketing to high-value marketing
- From supply-driven to demand-driven production (consumer satisfaction)
- From survivalism to entrepreneurship
- From conventional farming to organic farming.

Some of the transformations that took place in the value-added management of the agricultural business in China are explained below.

Vertical Integration

Agriculture product circulation serves as a connection between commodity manufacturing and utilization, allowing value to be created by successfully linking commodity supply and use. Anywhere in the supply chain is a potential place to add value to agricultural products. Vertical coordination has gotten a lot of interest in agricultural economics. Its mission is to enhance the quality of products by fostering closer ties among diverse organizations. The framework for agricultural value chain vertical management is shown in Figure 3. One definition of vertical coordination is "the alignment of operations and decisions by two or more separate parties in a supply chain that have a seller-buyer relationship" (Zhong et al. 2017). Consequently, vertical coordination is seen as a continuum, where greater coordination is required as supplier and buyer actions become increasingly interconnected. Furthermore, increased information sharing and shared decision-making are required. Coordination may be achieved in a situation when the two parties involved in a transaction are not independent. Many advantages accrue to the farmer as a result, including increased rural employment, decreased pricing spreads, less waste, improved raw material quality, and lower logistical costs. Business sustainability and the cost of constructing and running the processing facility are key concerns, but better by-product usage may also be improved (Priyadarshi and Routroy 2018).

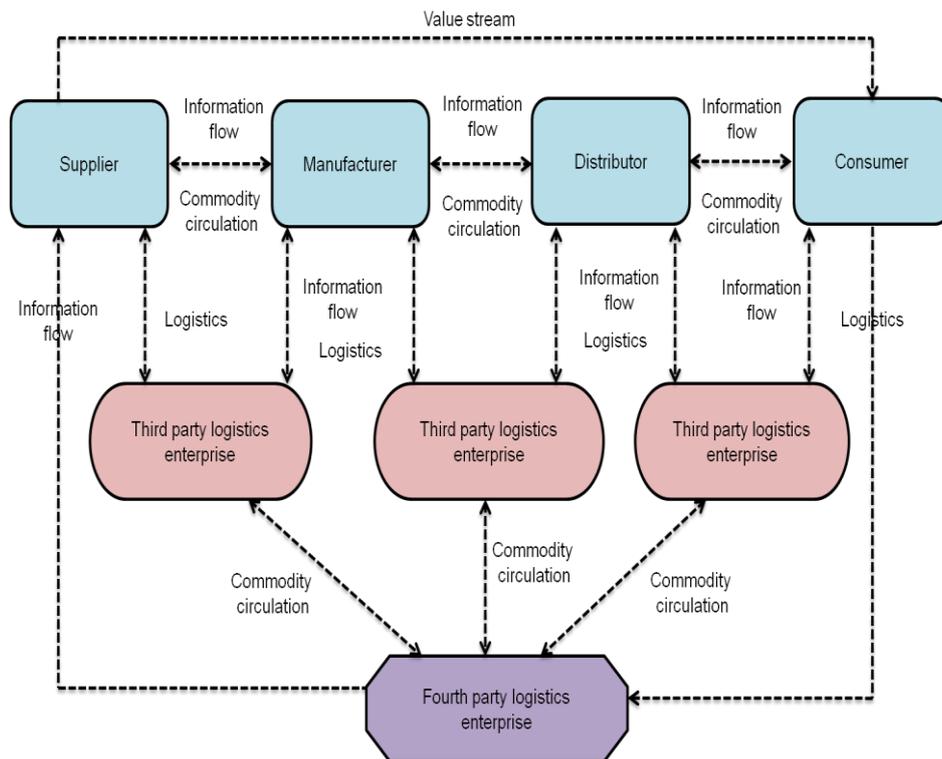


Figure 3: Vertical value chain management in agricultural enterprises

Efficient Agronomy information Transfer Techniques

Efficient and secured transmission of agronomy information helps in the value-added management of agricultural enterprises. With blockchain and edge computing, Hu et al. 2021 created an organic agriculture supply chain (OASC) trust architecture that provides a better trade-off between cost and efficiency than previous approaches. To further govern information flow, an innovative consensus method was developed in OASC, following its scenarios. In the future, China will be able to acquire traceability solutions at a reasonable cost thanks to this framework. Differences in the way agricultural businesses communicate their information have resulted in the existence of knowledge borders. Aiming to identify the knowledge barriers in the agricultural value chain, Mileva Boshkoska et al. 2018 are looking for ways to bridge them, as well as ways to evaluate them. As part of the agricultural value chain, they wanted to create a decision support system that could overcome knowledge barriers. Scientists from China Agricultural University in Quhzhou County, a typical county in the North China Plain, devised the Science and Technology Backyard (STB) model of knowledge transfer in 2009 to increase technology transfer and empower smallholder farmers in rural regions (Zhang et al. 2016). Innovations in research and agronomic service models connect the scientific and agricultural communities. As of 2017, there were around 88 STBs in China, spanning a wide range of biological areas. As a result of their research, these STBs have provided evidence-based examples for the sustainable intensification of agriculture in rural regions.

Contract Farming

For sustained agricultural development, the quality of agricultural goods must be improved. Contract farming is a popular option (Bilal et al. 2020). In China, contract farming is becoming more common. It is defined as a system for the production and supply of agricultural products under forwarding contracts, with the essence of such contracts being a commitment to provide an agricultural commodity of a type, at a price, and in the quantity required by a known buyer. For supply chain integration, contract farming provides suppliers

with better productivity and access to high-end markets, as well as increased income and decreased supply uncertainty for both the buyer and the seller. For the first time, farmers and firms may collaborate as legal entities and natural people in the same manner that one-to-many relationships between farmers and companies are unique (Shahabaz and Afzal 2020). The best way to help industrialization is to help agriculture, and the best way to help farmers is to help businesses (Schneider 2017). Agricultural growth in China since the late '90s has been characterized by the government's policy of replacing small-scale farming with large-scale agribusiness, which is seen as backward and unproductive. In the process, the government embraces the aim of replacing local markets with contract farming and consolidating scattered output. It was shown that the value of biofortified crops was influenced by the use of contract farming and a community network.

Emerging Co-operatives

Some have argued that because of the greater transaction costs associated with aggregating and delivering goods and services for a big population, purchasers choose to leave small-scale producers out of value chains that are driven by their interests. Development organizations, including NGOs and government agencies, assist small-scale producers to organize into collectives, like cooperatives, producer associations, and self-help groups, to involve them. Facilitator-driven models are a common term for these types of value chain models. Members of the cooperative have pooled their funds to create a mutual aid fund that may be used to lend money to a member of the cooperative who is unable to get a bank loan because of a lack of capital. Farmers in Heilongjiang province, China, were confronting marketing and financial challenges as they attempted to commercialize their corn crop. These limits encourage farmers to create cooperatives, which were connected with COFCO (a major Chinese food processor for marketing) and Longjiang Bank (a commercial bank for financing corn production) (Chen et al. 2015). Research and extension organizations are tapped by the COFCO to provide farmers with advice and technical assistance. For small farmers to get access to markets and improve their economic standing, cooperatives may be a useful tool. Farmer cooperatives allow them to negotiate jointly with both suppliers and customers of agricultural goods. Cooperatives, on the other hand, may assist farmers to satisfy the special needs of high-value-added food markets by supporting the flow of information between farmers and the market. Cooperatives may also aid in the achievement of food traceability, enhancing food safety as a result.

Reforms to China's agriculture and rural areas were first implemented in small regions before being scaled up and implemented nationwide. To raise farmers' wages, these included changes in the production management system, the flow of commodities, financing, and price liberalization. Agricultural sector growth in output and total factor productivity (TFP) was facilitated by the government's investment in R&D and other infrastructure developments. (Oyejide et al. 2019).

Price Monopoly

The efficiency of the value chain that circulates agricultural goods has a direct impact on price. Most fundamentally, according to Fan et al. 2021, an integrated pricing monopoly is the most essential technique to optimize the organizational mode of the agricultural value chain. Agricultural goods may be considered a fully competitive industry in the relevant area if their whole circulation value chain is seen as a provider of products. The value advantage provided by the organization in producers and other competitive sectors is more obvious when the agricultural value chain is a monopoly buyer, which may receive the end goods with a lower value. Increasing the number of agricultural goods transmitted to society by agricultural companies and realizing the value-added of the circulation chain are both possible outcomes

(Salihu and Zayyanu 2022). By creating a monopoly in the agricultural product market, the agricultural products circulation organization will be able to charge more for its goods. At this point, the company should maintain its pricing advantage, increase the supply of items with higher price elasticity of demand, adopt the strategy of "little profit but large sales," and boost product sales.

Iv. Conclusion

Improving the transformation and upgrading of agricultural goods by effectively managing the value chain is critical in this new era in the agriculture business. As a result, to ensure product quality and value addition while still operating at a reasonable cost, manufacturers must obtain stronger control over manufacturing, trade, and distribution processes. Furthermore, to compete in these markets, manufacturers must meet increasingly strict requirements for product quality and safety. This paper discussed the difficulties in agriculture value chain management and the required transformations in the agriculture sector in China. Further, various transformations that occurred in agriculture business management in China are discussed in this paper.

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