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# Researches on Countermeasures and the Status Quo of Agricultural Industrialized Cluster in Henan Province

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**Abstract** On the basis of the introduction of the connotation of agricultural industrialized cluster, the thesis introduces the competitive advantages of agricultural industrialized cluster as follows: firstly, it makes the agricultural production factors cluster and curtails the agricultural production costs; secondly it enhances the innovation abilities of industries; thirdly it improves the urbanization level of rural areas and increases farmers' income. The thesis also analyzes the status quo of agricultural industrialized cluster in Henan Province, points out the advantages of resources, cost, location and so on, and discusses the existing problems of the agricultural industrialized cluster in Henan Province as follows: firstly, the scale of agricultural industrialized cluster is small and the industrialized chain is short; secondly, there is a shortage of leading enterprises, and the radiating effect within industrialized cluster is not prominent; thirdly, the organization degree of agricultural industrialized cluster is weak, lacking scientific innovation ability. In order to solve the existing problems, the corresponding countermeasures are put forward as follows: firstly, take the market as the orientation, strengthen the policies formulation and accelerate the development of agricultural industrialized cluster in Henan by leaps and bounds; secondly, choose suitable developing models of agricultural industrialized cluster.

**Key words** Agricultural industrialized cluster, Industrialized chains, Leading enterprises, Henan Province, China

The agricultural industry cluster means that according to the requirements of regionalized layout, industrialized management and professional production, the independent and interrelated rural households, agricultural distribution enterprises, agricultural processing enterprises and other leading enterprises, exert the comparative advantage of agricultural production and form intense agglomerate aggregation<sup>[1]</sup>. The practice and experience home and abroad prove that agricultural industry cluster, as an important industrial organization form of rural economic development, is not only conducive to promoting China's rural economic development and perfecting the structure and function of rural market system, but also conducive to promoting agricultural industry upgrade and elevate the holistic competitiveness of agricultural industry. Since the 1980s, along with the development of town enterprises in Henan Province, the industry cluster has begun to emerge sporadically in some parts of Henan Province. Recently, influenced by the quick development of non-public sectors of the economy and county economy, and transformation of traditional manufacturing industry, the industry cluster in Henan Province tends to develop rapidly, which is a new tendency of economic development in Henan Province. However, there are some problems in Henan Province as follows: the quantity of industry cluster is scanty, making negligible contribution to the economy of Henan Province; the industry chain is not complete and the jointing of upstream enterprises and downstream enterprises is not close. This severely balks the development of industry cluster in Henan Province. The thesis probes into the status quo and existing problems of modern agricultural development in Henan

Province, and proposes the countermeasures and suggestions in order to promoting the development of industry cluster in Henan Province, which is significant to the development of industry cluster in Henan Province and realization of enriching the people and powering the province.

## 1 The competitive advantage of agricultural industrial cluster

Agricultural industrial cluster is an important approach of better organizing farmers in their access to the market and improving the overall efficiency of agriculture, which has prodigious advantage in comparison with traditional management model.

**1.1 Make the agricultural production factors cluster and curtail agricultural production cost** The industrial scale economy means the cost decrease of production enterprises caused by the clustering development of some industry. The development of agricultural industry cluster makes the agricultural resources and production factors cluster. When the professional talents, sales network, market share, capital and technology develop to a certain scale, the scale economy and economy of scope of agricultural industrial development will form. Once the cluster forms, it will have self-strengthening mechanism. All enterprises form the firm cluster chain of agricultural production so as to decrease transaction cost of space. In addition, the scale economy is also conducive to the professional division of labor within industry and the generation of soft mode of production so as to decrease the production cost of enterprise within industry, promote production efficiency and finally elevate market competitiveness.

**1.2 Promote industrial innovation ability** Cluster is the hotbed of nurturing the ability of learning and innovation of en-

terprises. Among the main body of production and management in the agricultural industry cluster, there is mutual association of various kinds of competitions or cooperation. If it is the competitive association among enterprises in the cluster, it is bound to generate pressure of competence between the two parties. The competition between Sanquan Quick-frozen Food Company and Sinian Quick-frozen Food Company in Zhengzhou City is a typical case. The two enterprises incessantly research and develop new technology, adopt new food technology, promote production efficiency and form a kind of healthy competition in order to expand market share. If it is the cooperation mode among enterprises in the cluster, due to the notable technological correlation, the market demand is transmitted via technological chain to the upstream enterprise and downstream enterprise, which results in the comprehensive innovation of the correlated industries. While the market forms efficient organization forms, and eliminates the market risk caused by innovation by freely distributing factors so as to realize the self-innovation effect of whole technological system, which is beneficial to the increase of production efficiency and incessant innovation of technology.

### 1.3 Promote rural urbanization level and increase farmers' income

The formation of agricultural industry cluster tends to generate a large batch of agricultural correlated enterprises in a certain region. They are the source momentum of developing rural economy, which not only bring capital, technology, and advanced production equipments, but also promote the infrastructure construction of rural water conservancy, energy, transportation and telecommunication, and further elevate the rural urbanization level. In addition, the mushrooming of multitudinous enterprises tends to attract a large batch of rural labor forces. The concentration of population not only brings vitality for the local agricultural market, but also further promotes the matched tertiary industrial development so as to offer opportunities to increase farmers' income directly or indirectly. After the farmers' income increases, it will elevate their consumption ability and improve their consumption structure so as to further promote the rural market prosperity and urbanization level.

## 2 Agricultural industrial development situation and existing problems of Henan Province

### 2.1 The present situation of agricultural industrial development of Henan Province

From the practical situation, in the recent years, due to policies to support and benefit agriculture of China and the government of Henan Province, Henan Province makes full use of superior location advantages, convenient traffic conditions, and abundant resources of agricultural products. It has formed characteristic agricultural industry clusters.

According to the relevant statistics, in the year 2009, there were more than 200 agricultural industrial clusters with the output value more than 0.1 billion yuan each. Thus, it formed two large-scale agricultural industry chains in the whole province. One was the industry chain of wheat-flour-flour product deep

processing. At present, the output of wheat and oil in Henan Province ranks first in China; the output of cotton ranks second in China; the output of corn, soybean and so on always ranks the first three. At present, the grain-deep-processing ability of Henan Province is strong. It has reached more than 30 million tons every year. The output of wheat flour, instant noodles, fine dried noodles, biscuits and the quick-frozen food rank first in China. The domestic market share of quick-frozen food is more than 60 percent and market share of instant noodles reaches 25 percent. Some well-known brands have emerged such as Sanquan, Sinian, Baixiang, Nanjiecun and so on. The other is industry chain of livestock and poultry-slaughtering-slaughtering and processing-deep processing of meat. At present, the breeding amount of cattle in Henan Province ranks first in China; the breeding amount of sheep ranks second in China; the breeding amount of pigs ranks third in China. In the year 2007, the province processed 5.78 million tons meat. There were approximately 400 leading enterprises specializing in processing products of livestock and poultry. Some large processing enterprises of livestock and poultry food have emerged, such as Shuanghui, Huaying, Zhongpin, Yongda and so on, especially Shuanghui Group, having become the biggest meat processing bases in China.

The rapid development of agricultural industry promotes the rise of a large number of leading processing enterprises of agricultural products. They develop incessantly, and play the role of radiation and driving in promoting agricultural production. For example, Sanquan Food Company, an enterprise in Zhengzhou City, consumes 0.024 million  $\text{hm}^2$  wheat, 0.016 million  $\text{hm}^2$  rice and 0.05 million tons of meat, which not only makes plenty of agricultural products realize transformation value, but also increases job opportunities for rural labor forces and 0.024 million urban laid-off workers directly. It propels the rapid development of a large batch of specialized bases of growing and breeding, and solves the problem of increasing 0.4 million farmers' income.

### 2.2 The existing problems

#### 2.2.1 The scale of agricultural industry cluster is small and the industrial chain is short.

Nowadays, apart from several industry clusters which include some key enterprises such as Shuanghui, Sanquan, Nanjiecun and so on in Henan Province, most are small-scale and sporadic industry clusters. Most of them cluster, but they are not unmatched. The programs with high technological content and high added value are scanty. These enterprises cannot make the industry chain powerful. For example, the production output of wheat in Henan Province accounts for more than half that of China, but recently the grain in the main production area of grain is sold to other places. The deep processing is not adequate, and there is a shortage of high added-value products. The transformation ability of grain processing is weak and the industry chain is short. According to the related data, recently the ratio of grain processing production value and the grain production value is less than 1:1, lagging behind the level of 5:1 of developed countries. The added-value potential of agricultural products processing is not exerted

fully, which hampers the perpendicular extension of industry chain and enervate the external economy of agricultural industry cluster, thus agriculture is hard to breach the trap of autarky to actually realize industrialization.

**2.2.2** The quantity of leading enterprises is small, the ability of radiation and driving within industry cluster is weak<sup>[2]</sup>. Recently, the scale of most enterprises in Henan Province is not large and the economic strength is limited, so it is hard to form the effect of radiation and driving in the periphery. The benefit nexus between enterprises and farmers is not firm. The enterprises and base construction do not match. It lacks large agricultural leading enterprises which have remarkable ability of expanding market, organizing production and offering comprehensive service in order to solve the sales problem of agricultural products. It is merely the purchase relationship between some leading enterprises and farmers; some leading enterprises only sign the contract of purchase and sales with farmers, but the corresponding technology service and price protection cannot be implemented. The leading related agricultural matching level is low. The quality test of agricultural products, information of demand and supply of agricultural products, agricultural resources and ecological protection are outdated.

**2.2.3** The organization degree of agricultural industry cluster is low, lacking technological innovative ability. China's clusters are mostly on the basis of low cost, but not on the innovation. The standardized level of agricultural industry within cluster is not high; the concentration degree of industrialization is low; the specialization process is slow. The products lack market competitiveness, and processing technology of many small-and-medium-sized agricultural products is outdated, so it is hard for them to participate in the integrative big market competition. In the socialist market economy, the enterprise is the main body of innovation system. The relatively weak ability of innovation makes the management of agricultural industry cluster become low level repeated construction. There are always vicious competitions and it is hard to establish famous brand. The industrial structure of agricultural products is irrational, and the industry chain between food market and food industry, and agricultural raw material bases does not take form.

### **3 The countermeasures and suggestions of promoting the development of agricultural industry cluster in Henan Province**

**3.1 Take market as orientation, strengthen policy formulation and propel the development of agricultural industry development of Henan Province step by step** The main body of management of agricultural industry cluster is enterprise and farmer. In fact, playing the role of government does not mean that the government abuses its rights in some respects. The government should take market as orientation, and monitor, adjust and induce industry cluster so as to provide guidance for the development of agricultural industry cluster and promote the development of agricultural industry cluster ultimately. The function of government main includes the following aspects.

**3.1.1** Further determine the strategic objective of the development of agricultural industry cluster and implementation planning. The industry cluster develops degree by degree from small to big. Formulating the planning of cultivating and developing industry cluster is the prerequisite of guiding the agricultural enterprises to allocate resources rationally, and promoting the formation and development of industry cluster. The government should take developing industry cluster as the key part of agriculture and rural economic development of the Twelfth Five-Year Plan of Henan Province. According to the local reality, the government should coordinate and plan the development of industry cluster, and formulate the strategic objective of developing agricultural industry cluster, the developing focus and the relevant matched policies and countermeasures, so as to make the institutional innovation meet the internal need of technological innovation, and provide institutional basis and momentum for technological innovation.

**3.1.2** Create the environment beneficial to the development of agricultural industry cluster. By using the policy means of finance and revenue, the government should increase the investments in rural public infrastructure, the transportation infrastructure and telecommunication information service significant to the sustainable development of agricultural industry for instance. Thus, it will create good hard environment for the development of agricultural industry cluster. The government should strengthen the construction of various kinds of agricultural associations, and encourage the industrial associations to hold multifarious activities of communication and transaction regularly or irregularly in order to make the technological information and knowledge flow freely among agricultural enterprises; the government should reinforce the service of logistics and information, and build and perfect agency service system; the government should strengthen the construction of various kinds of educational training companies which is conducive to the diffusion of agricultural applied technology and the cultivation of related technological talents, so as to create a soft environment suitable for the development of agricultural industry cluster. In addition, the government should actively propose wise suggestions for solving the problems of investing and financing of agricultural enterprises, and encourage the financial sectors to provide many financial products for enterprises and reinforce the degree of policy guidance and support.

**3.1.3** Cultivate leading enterprise to promote the clustering development of leading industry. One of the scholars Fan Duo compares industry cluster to a forest, and the key leading enterprise is the first tree seed. As the key section of construction of agricultural industry cluster, leading enterprises should get more support from the government. The government should further adopt measures of cutting enterprise income tax and subsidizing interest to loans, strengthen the degree of support, and create a better policy environment, in order to make more and more enterprises become national and provincial key agricultural industrialized leading enterprises, and strengthen the role of radiation and driving. Besides, the government should encourage cooperation between the leading enterprises and

powerful scientific research institutes and universities, establish technology research and development centers, research the core technology, and continuously improve the leading enterprise's ability of developing products and independent innovation. Small and medium-sized enterprises can depend on market and management of the leading enterprises, and cooperate with the specific market division system in order to develop and exert its limited advantage of resources, and become part of the leading enterprises. Meanwhile, leading enterprises can also engage in a subcontracting cooperation with small enterprises to enhance their flexibility.

**3.1.4** Emphasize the industrial connection to promote the healthy development of industrial cluster. In the process of developing agricultural industry cluster, according to the requirements of modern enterprise system, we should transform from emphasizing scattered projects to emphasizing the concentrative industry chain. And we should consider the correlation between agricultural leading enterprises and the upstream and downstream enterprises to promote industrial internal division and establish interdependent relationship. Thus it forms a kind of perfect network system of close cooperation among large, medium-sized and small enterprises, and specialized division of labor and collaboration in the agricultural industry cluster so as to generate agricultural cluster effect. Meanwhile, we should attract those programs with industrial driving advantage, industrial connecting effect and the function of cooperation into agricultural clusters.

**3.2 Choose a proper agricultural developing model of industrial cluster** Because Henan Province has a wide expanse; different resources, industry base, and social cultural background are in different cities and counties; the suitable developing projects are different, so when developing diversified agricultural industrial cluster, we should choose agricultural development model of industrial cluster coinciding with the local practical condition, and give play to local advantages and characteristics. According to agricultural development condition in Henan, Henan agricultural industrial cluster has the following four developing models basically.

**3.2.1** Relying on agricultural resources advantage of Henan Province to develop agricultural industry cluster with characteristics. For example, the poultry processing industry cluster which concentrates in Hebi City and Xinyang City; the meat processing industry cluster which concentrates in Luohe City, Zhoukou City and Xuchang City; the food processing industry cluster which concentrates in Zhengzhou City; the sesame processing industry cluster which concentrates in Zhumadian City and Zhoukou City; the tea industry cluster which concentrates in Xinyang City; the fruit processing industry cluster which concentrates in Sanmenxia City and so on.

**3.2.2** Relying on the location advantage to develop agricultural industry cluster in Henan. It definitely points out in *the General Program of Development of the city circle in Central China* that agricultural production layout should be optimized; suburban agriculture and high efficiency eco-agriculture should be rapidly developed. In the suburbs around cities, we should de-

velop modern agricultural gardens through big efforts; actively develop sightseeing, tourism and leisure agriculture; focus on constructing high technological sightseeing agricultural belt along Yellow River in Zhengzhou City and so on; encourage other eight cities to develop industries of flowers, forest and green fruits and vegetables actively in the suburbs in order to realize organic combination of urban residents' recuperation and leisure, and promote agricultural benefit. In the far suburbs around cities, we should develop eco-agriculture rapidly and focus on speeding up the construction of a series of projects, such as the suburb forest park in Luoyang City, high efficiency agricultural demonstration gardens in Kaifeng City and Yanling flowers production base and the like.

**3.2.3** Relying on the market to develop agricultural industry cluster in Henan. We should take advantage of the role of the radiation and driving of the market and make full use of the market information in order to form the industry cluster around the market<sup>[3]</sup>. For example, the Xixia County in Nanyang City of Henan Province is the largest production base of mushrooms in China (accounting for 1/10 approximately of national total output). They grasped the opportunity of establishing national mushroom standardization production demonstration base, and carried out regional management, standardization production and industrialization management, so as to open a "green tunnel" of selling mushroom to international market. At present, the export of mushroom in Xixia accounts for 1/3 of the national total output. Aiming at setting up mushroom market, 15 specialized towns, 100 specialized villages, 140 standardized cultivation bases of mushrooms have been established, and the overall scale is 100 million bags. The quantity of farmers who engage in cultivating mushroom has reached 30 000, accounting for 1/3 of whole county farmers, and 39 percent of per capita net income of farmers is from the mushroom industry.

**3.2.4** Relying on the science and technology and so on concerning agricultural services to develop agricultural industry cluster. We should make good use of efficient and quick modern information network to provide efficient services for leaders to make decisions on agricultural industry; we should guide the leading agricultural enterprises to apply new technologies and operating management methods to make a plan for agricultural production and circulation so that it can drive adjustment of agricultural industrial structure; we should build and perfect agricultural information system and make full use of agriculture-related websites; we should set up provincial, municipal and county level agricultural internet information centers, and establish agricultural information platform to realize internet connection and data shares between Henan Province and the national agricultural sectors, and even international agricultural products markets so as to gradually form modernized information collecting, analyzing and releasing system; we should further strengthen the research, development and use of agricultural information resources, cultivate and perfect agricultural information market to improve quality and benefit of development and use of information resources.

on are included.

**4.2.2** Subsidies for the replacement costs of using environment-friendly inputs. With the widening of the prohibited and limited range of using agricultural inputs, such as pesticide and veterinary pharmaceuticals with high residue, agricultural producers should use new inputs, such as agricultural chemicals with high effectiveness but low poison as well as residue according to the requirement of standardized production, thereby the production costs will slightly increase.

**4.2.3** Subsidies for the costs of using physical control technology of insect pest. Physical control of insect pest is the main content of agricultural standardization. It possesses the features of reducing the utilization of agricultural chemicals as well as preserving ecological environment, and insects won't have resistance. Seen from the practice in various areas in China, it has fairly obvious effect. The purchasing and utilization of necessary equipment, such as pest killing lamps and pest sticky cards, brings obvious rise in production costs.

**4.2.4** Subsidies for production record and file building. According to the requirement of standardized production, agricultural producers should record all productive behavior faithfully and thoroughly, especially the breeds, dosage, times, withdrawal period and plastochron of the utilization of pesticide and veterinary pharmaceuticals, to prove the regulatory and scientific production process and make the quality safety traceable. The establishment and maintenance of production records and files may cause the rise of production and operating costs directly.

**4.2.5** Subsidies for apparatus of quick testing products and self-inspection. According to the requirement of *Laws on Quality Safety of Agricultural Products*, all agro-products on sale should be qualified in self-inspection. The implement of self-checking will surely increase the productive costs of agro-products, including the equipment of quick testing apparatus for self-inspection, the consumption of inspected reagent, the expenditure of water and electricity in the process of inspection as well as the maintenance of apparatus.

**4.2.6** Subsidies for the costs of product identification and logo utilization. The optimizing and breeding of products is the ultimate goal of standardized production and the final demand of consumers. The identification of agro-products consists of the identification of healthy agro-products, green food, organic agro-products as well as the geographical indication of agro-products. However, product identification usually requires environment inspection of the producing area and quality inspection of the products neither of which is free of charge. Besides, product identification and logo utilization also bring relative costs.

**4.2.7** Subsidies for the costs of standardized trainings. Agricultural standardized production covers various sectors before, during and after production. Knowledge and techniques concerning production, management, supervision and so on should be mastered. Strengthening trainings and advancing

qualities are the key task of implementing standardized production which should be persisted. Training activities may increase production costs.

**4.3 Compensation mechanism** Supported by items, ecological compensation of the quality safety of agro-products is implemented. At present, the form of project support is adopted in many aspects in China, such as converting cultivated land into forests and returning grazing land to grassland. And the implement of ecological compensation has got sound effect. Considering the risk factors that can influence quality safety of agro-products, such as the deterioration of agricultural producing environment in China and the unreasonable utilization of chemicals and pesticide, ecological compensation with special purposes should be established as soon as possible, guiding farmers to use environment-friendly productive techniques and inputs.

## 5 Conclusion

To summarize, the mechanism of agro-ecological compensation is to internalize the externality of the protection of agro-ecology through certain political means, making the "beneficiaries" of the achievement of ecological protection pay related fees and the "losers" get some compensation. To put it another way, the biggest achievement of establishing agro-ecological compensation mechanism is to be the preservation of agro-ecological environment and the effective supply of agro-products with safety and high-quality. The establishment of agro-ecological compensation mechanism beneficial to the quality safety of agro-products can effectively resolve the "hitchhike" phenomenon in the supply and consumption of agro-products with safety and high-quality, encourage producers to adopt advanced and proper productive technology and safe agricultural inputs and improve the level of quality safety of agro-products.

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