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The Experience of International Agricultural Clusters and Enlightens for China

Ping LIU^{1*}

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ABSTRACT: Agricultural cluster is an advanced type of agricultural industrialization. It is great significant in promoting regional economy growing, enhancing the rural competitive strength, advancing the specialization of agriculture production and increasing the incomes of the farmers. Based on analyzing the experiences of the U.S. corn and wine cluster, French wine cluster, Dutch flower cluster and Polish rural producers groups and wide range of agricultural-based clusters, this paper discusses the main characteristics and existing problems of agricultural industry in China, and summarizing the enlightens to China's agricultural cluster development.

Keywords: agricultural cluster, experience, enlighten, China

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The Experience of International Agricultural Clusters and Enlightens for China

1. Introduction

A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (Michael E. Porter, 2000). In recent years, more and more researchers and related institutes, such as policy makers, legislatures, business leaders, academics, economic development practitioners and development agencies have paid substantial attentions to industry cluster. In China, arrays of articles are about industry clusters. With the development of agricultural industrialization process, we need highly emphasis on the agricultural clusters. Agricultural clusters mainly consist of dragon-head enterprises, township enterprises, the other groups of enterprises which gather together around the rural cities and towns or surrounding areas, and related or complementary organizations and institutes. During their forming and developing processes, plenty of units and related organizations aggregate in a particular rural region according to definite economic ties, thus form industrial communities similar to organisms (OECD, 2001). In some American and European countries, agricultural clusters grow quite well, such as Dutch flower clusters, French wine clusters, American corns and wine clusters, Polish farmer groups and agritourism, etc.

2. The Great Value of Agricultural Clusters

Agricultural cluster is the trend of modern agricultural development. It is great significance in promoting regional economy growing, enhancing the competitive strength, advancing the specialization of agriculture production and increasing the incomes of the peasants.

First of all, agricultural cluster can push forward the development of regional economies

Localization economy is the chief pattern of cluster economy (Isard, W., 1956). The related businesses gather in one area because they produce the same or homogeneous products. Their aggregations come into being economics of scale. This will help to decrease the costs and absorb more clients. Based on the mutual trust and confidence, the actors arrange an economic network. They cooperate and compete in the net. Catching-up Effect derives from their competition. At the same time, it will be easy for the actors to adopt new technologies and organizational forms based

on the knowledge spillover and diffusion to increase production. More and more empirical and theoretical researches identified that the information exchange and adjustment comes from external is very important for the successful innovation within the cluster area. The synergy enhances the regional innovation capability and pushes lots of clusters to get regional brand effect. The main products produced by the clusters have stronger competitive strength. They have high brand recognition. Especially the new clusters which include the development of some industries related to agriculture, such as agricultural service, are more influential because of their products possessing the innovative activities. So it is easy for them to form local brand. The local brand will help the region to enhance and consolidate its image to investors and consumers, and it will be helpful for the branding area to develop synthetically and harmoniously.

Secondly, Agricultural Cluster is Favorable toward Promoting Competition Strength of Cluster Enterprises

In 1990, Porter published his famous work *Competitive Advantage of Nations*, in this book, he mentioned the theory of Competitive Advantage of Nations. This theory discussed a variety of conditions that definite nations or regions should have to win the dominant positions in the international competition. There are 4 internal factors and 2 external influential factors in this theory (figure 1). The former four are basic conditions and they act each other. They are factors of production, demand conditions, performance of the related industries and supporting industries, and the strategies and structures of companies and competitors. The latter two are opportunities and governments. The dynamic integration of these factors will be crucial for the definite industry to gain the competitive advantage. In agricultural clusters, the companies establish relations and cooperation to organize a netted texture. According to Porter's theory, the net makes the gaining of competitive advantage easily. Clustering effect is the inner dynamic for agricultural cluster to develop sustainably and for the cluster enterprises become more and more competitive.

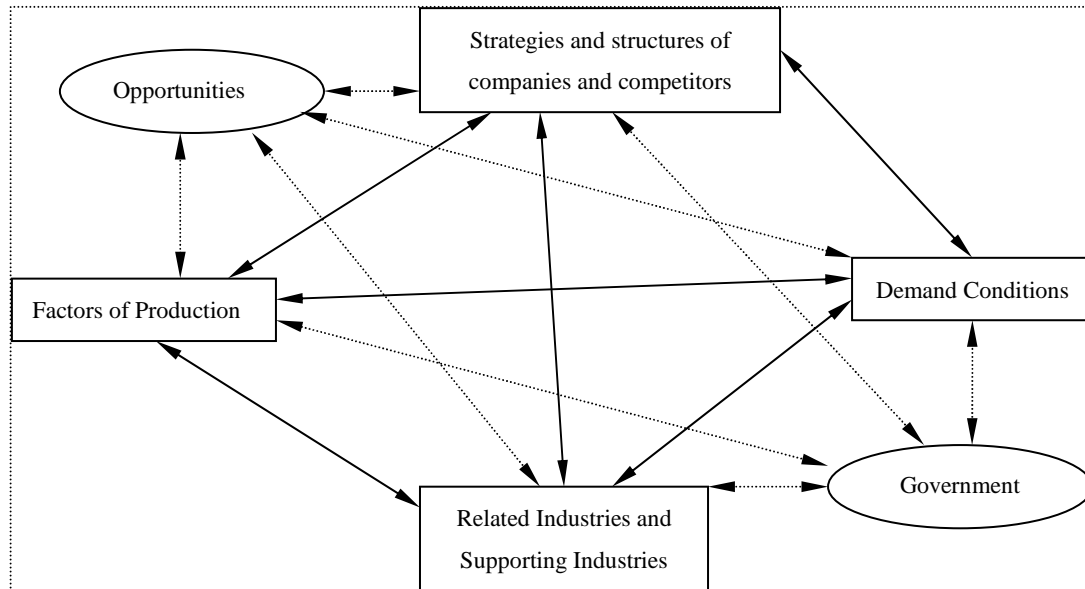


Figure1 Michael Porter Diamond Model

Source: Michael. E. Porter, the Competitive Advantage of Nations, Harvard Business Review, Mar-Apr, 1990:78

Lastly, advancing the specialization of agriculture production and increasing the incomes of peasants

The formation of agricultural cluster relies on the specialization of agriculture production and in turn it advances the degree of specialization. Specialization of agriculture production can not only improve the agricultural technology level, but also contribute to realize mechanization of farming, resulting prominent agricultural scale economies. At the same time, the cooperation among the farmers is helpful to upgrade their abilities in resisting market risk, then stabilizing the market price and increasing the peasants' income. In addition, the geographical concentration provides more career opportunities for surplus rural labors. And with the progress of agricultural technology, the quality of rural labors is improving. All these above benefit to improve the peasants' living conditions directly or indirectly.

3. The characteristics and experiences of some typical Agricultural Clusters abroad

3.1 Corn and wine clusters in America

In America, corn productions are mainly concentrated in the Midwest. At the same time, it is the biggest corn industrial area in the world. Since 1940s, the Midwest of America has become the main areas producing corns. Now the productive areas include about 15 states, from Minnesota to

Texas and from Colorado to North Carolina. The planting areas and gross production there are both about 80% of the whole country. There are 5 states in which the productions are nearly 2/3 of the whole country. The corn industry impacts on animal husbandry. 2/3 of American pigs feeding and 1/4 of meet cattle are in the corn cluster. All these advance economic status and agricultural competitive strength of this corn industrial area in the global world.

Meanwhile, soybean, grape and cotton all show cluster trend in America, especially the typical wine clusters in California. California accounts for about 90% of all US wine production (OVI 2006). The California wine cluster centered around the Sonoma, Santa Clara and Napa Valley and the University of California at Davis (Andrea Migone & Michael Howlett, 2010). This is a cluster with both vertical and horizontal links among its actors. It includes more than 680 commercial wineries and thousands of independent wine grape growers. They are at the core of the process in California and upon them hinges a broad set of companies and institutions, including suppliers of grape stock, irrigation and harvesting equipments, barrels, and labels; specialized public relations and advertising firms; and quantities of wine publications aimed at consumer and trader, which provide the winemakers with services and goods in both the upward (viticulture) and downward (winemaking) stages of wine production. A lot of local institutions, such as the world famous viticulture and enology program at the University of California, Davis, the Wine Institute, special committees of the California state senate and assembly, are all involved in this cluster (figure 2) (Machael E. Porter, 1998). Moreover, this wine cluster also connects with three other industry clusters: the agriculture, food and catering, and wine country tourism (Machael E. Porter, 2000).

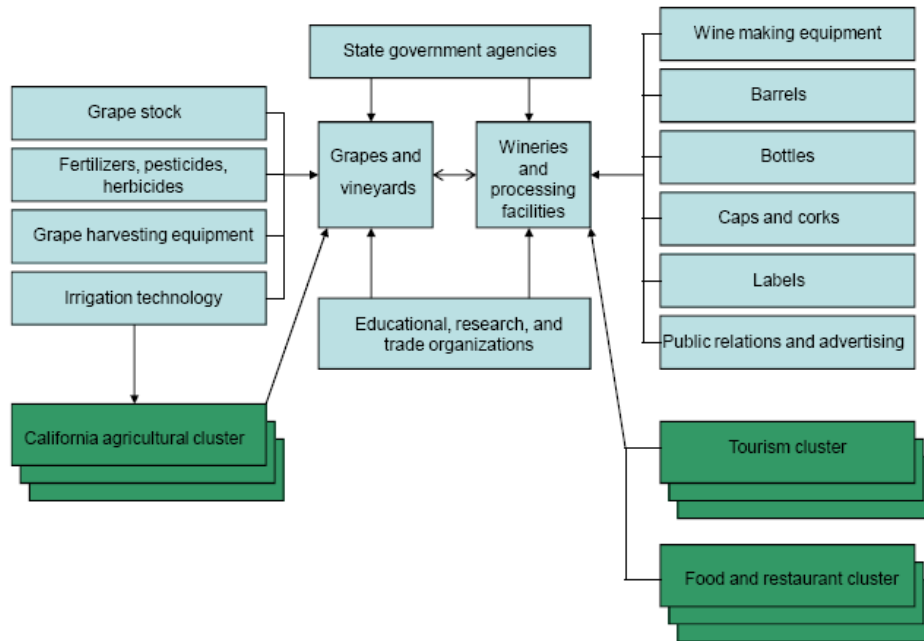


Figure 2 Diagram of the Wine Cluster in California

Source: Machael E. Porter, *Clusters and the new economics of competition*, Harvard Business Review, Nov-Dec, 1998:80

American agricultural cluster has become more and more mature after decades of development. Its maturity benefits from two main aspects: on one hand, America has formed agricultural cluster centering on processing or sales enterprises. This cluster possesses high efficient organizational system which integrated with producing, supplying and marketing. Agro-processing industries , business and agricultural cooperative constitute the body of the cluster. Food processing is the biggest one among manufacturing industry, and agro-processing is the dragon-head of agricultural cluster. On the other hand, the system of law and statute insisting on agriculture and rural socialized service system are growing to perfection. American agricultural policies aim at increasing peasants' income. In last century, the government issued a series of agricultural industrial measures, including insisting the link of production policy, insisting agricultural foreign trade policy and agricultural insurance, etc. The implementations of the policies are specifically through a variety of measures, for instance, stabilizing prices of agro-product, expanding financial expenditure on agriculture, and increasing subsidies for farmers.

3.2 Wine Cluster in France

France's agriculture is the most developed in Europe, and France is the largest exporter of

processed agricultural products in the world. Developed modern agriculture can not do without well-developed agricultural cluster. To take full advantage of natural conditions and agricultural resources, France concentrate different crops and livestock production in appropriate areas reasonably, to form diverse agricultural cluster, of which the grape and wine industry are with the most long lasting development. Wine industry is not only the country's leading industry, but also leads the development of tertiary-industry, such as service, transport and tourism in particular. In France, wine is very famous. Burgundy and other regions are known for rich wine.

Burgundy is one of the famous wine industrial areas in France. Wine grape planting area is of 27 000 hectares in Burgundy, producing 150 000 million liters, and annual output of wine is 200 million bottles. The climate there is continental. It has various soils, different slopes with different soil, and even hillside and foothill of one same mountain are different. So different styles of wine can be brewed by two owners of the same vineyard. These make Burgundy as the most puzzling wine region in the world.

In Burgundy region, the wine cluster has its own special characteristics:

Firstly, it has unique pattern of grape cultivation and processing

Rainfall is above normal in Burgundy. The majority of grapes are planted in sloping areas for ease of drainage. The grape growers focus on natural cultivation methods, avoiding using fertilizer, and limiting to 400~500 kilograms per mu.

Secondly, brewing technique is an integration of traditional technology and modern scientific technology

Different materials decide different wine. To fulfill different levels of consumer, the first step of the traditional Burundian wine-making process is to select raw materials carefully according to the index detected from the raw material contents, then followed by using modern technology to form the original characteristics. This integration of traditional and modern technology makes better quality wine.

Thirdly, they promote the reputation of wines through all kinds of ways

In order to promote the development of wine brands and improve the quality of wine, French wine assessment activities will be held annually. During the event, by holding civilian activities and wine tasting activities, local wine industry aims at cultivating and promoting wine brands. Through the Wine Institute, they sell wine by supermarkets, special shops and restaurants, or sale

it directly on orders. Amounts of managers aim at improving their business' economic performance and improving the reputation of their wines. They orient towards increasing exports. Their targets are mainly in EU, such as, United Kingdom, Russia, Belgium, Switzerland and Germany, etc.

Fourthly, scientific technology promotes wine cluster development

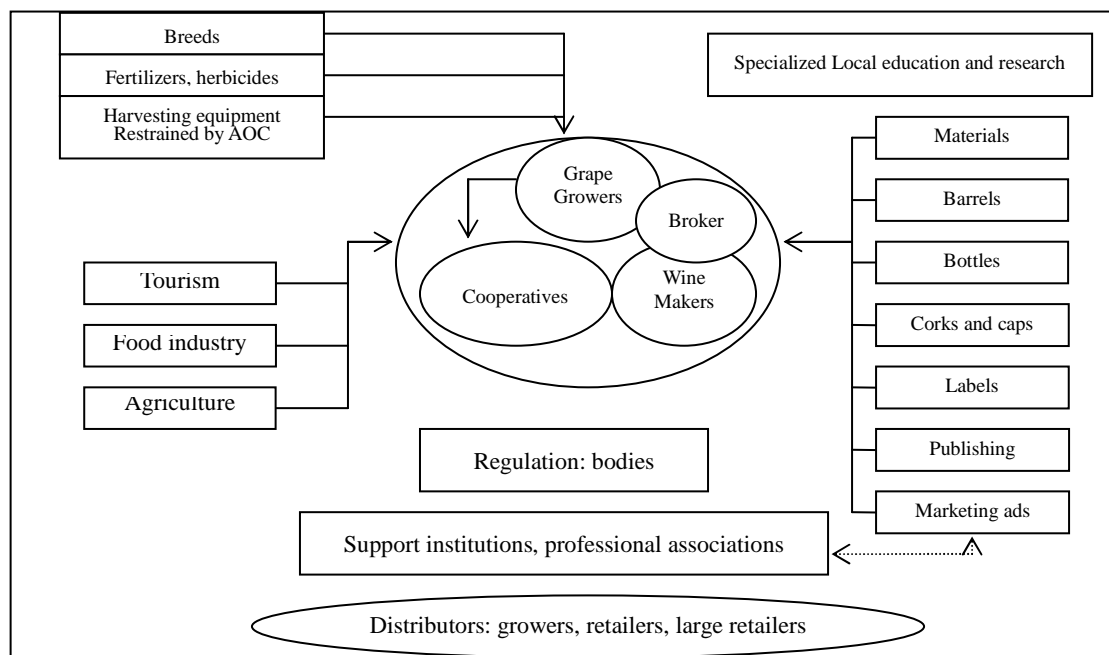
The region has various institutional structures in place including the Burgundy Wine School and the Burgundy Wine Board (BWB), which brings together the trading side of the business and the growers (Andrea Migone & Michael Howlett, 2010). And in universities, some of the professors are usually the managers of certain wineries, thus ensuring the long-term vitality of the wine industry. Moreover, the Government pays more attention to wine research and related technical training. Subsidies for training of technical staff are up to 90% of all the grants.

Lastly, Standardized management is strict

In 1935 the government passed a variety of laws to protect the quality of wine. Chiefly among them is the Appellation Origin Controlled (AOC) system, which became the standard for all subsequent origin appellations. The system required that the wine should be produced from grapes collected in a specific region and in a traditional and consistent manner. France has developed a large number of wine regions and their production accounts for about half of all French wine. The appellation system is overviewed by the Institute National of Appellations Origin (INAO). Along with the AOC other quality system exists in the country (Ditter, Jean Guillaume, 2005). In France, classification of wine is perpetual. Different levels have special restrictions on land, production, varieties and brewing process. Random spot checks are conducted every year, those who fail will be degraded.

Generally speaking, French wine cluster is advanced. Its advancement derives from the following aspects: ever since a long time ago, the government established strong support for agriculture through investing huge amounts of money into agricultural infrastructure, providing low-interest loans and low-cost lands to farmers, and implementing Preferential tax policies of agriculture and rural social security system, to inspire farmers to be at ease and happy; French agriculture specialization includes regional specialization, farm specialization and operations specialization. The high degree of specialization improves French agricultural cluster development quickly; France pays more attention to technological advances in agriculture. It not only established

multiple types of agricultural research institutions, but also trained a large number of agricultural researchers. Their main task is to provide both basic research and applied research for the modernization of French agriculture, thus providing a good scientific and technological innovation conditions for French agricultural cluster (GAO,S & HONG,Y ,2010). During the period of production-supply-marketing, wine enterprises and linked institutes combined organically. The region of Burgundy has been analyzed by Ditter in terms of cluster structure (figure 3) (Ditter, Jean Guillaume, 2005).



Source: Ditter, Jean Guillaume. 2005. Reforming the French Wine Industry: Could Clusters Work? *Cahiers du Ceren* 2005:49

Figure3. The Burgundy Wine cluster

3.3 Flower cluster in Netherlands:

Located in the north-west of Europe, the area of Netherlands is 41,500 square km, the population is 16 million. It is one of the most important exporters of agricultural products in the world, and its flower exports accounted for more than half of the global flower trade volume. Currently, the Dutch horticulture accounts for 42% of their total output value of agriculture. Annual exports of cut-flower, bulbs and ornamental plants are up to 6 billion dollars. Flower exports accounted for 70% of the world (ZHANG Q, 2005). Dutch bulb trade accounts for 80% of the world trade volume, potted 50% and fresh cut-flower 60%. The varieties of flower have been more than 11,000 and bulbs are exported to more than 100 countries and regions.

In the past 10 years, although the flower industry in United States and Israel are growing rapidly,

the dominant status of Netherlands can not be shaken still. After hundreds of years development, linked institutes of Dutch flower industry, such as scientific research, breeding, propagation, planting, auction, broker, import and export traders, technology providers (including greenhouse, heating and irrigation, etc.), management, education, infrastructure (ports and airports) and sales connect closely. The entire value chain forms a careful division, playing a cluster effect. Porter praised the Dutch flower industry is the “World’s most innovative industry cluster.”

Mature development of Dutch flower clusters is benefit from the following experience:

- Highly specialized production and scientific social division of labor

The division of Dutch flower industry is very fine, for example, the production and sale are definitely separated, and auction market is responsible for sales. In production, the specialization is also shown, for instance, a farmer plant only one kind of crop, and even a variety of one crop. The advantage is that it not only reduced costs and improved product quality, but also formed a scale. At the same time of promoting individuation of variety and technical development, it prevented unnecessary internal friction among flower growers, avoiding the rush to plant the same species. In the service, the division is also very fine, including specialized companies, breeding, greenhouse and transport, and even having a special company in charge of soil.

- A powerful mixture of scientific research popularizing with production and market demands

The technology content of the Dutch flower has been advanced in the world. Netherlands leads the world in the technology content of flower. In a great extent, this profits from the reasonable R&D system and effective mechanism, which focuses on practical utility, the high combination of scientific research and promotion with production and market. Dutch flower research institutes can be divided into three levels, which are institute of university (such as the largest Dutch agricultural think tank--famous Wageningen Agricultural University and Research Centre), state-run institute and the institute of company. There are more than 60 institutes run by the large companies and more than 6000 researchers engaged in research. They mainly engaged in applied technologies and theoretical studies, such as breeding, cultivation techniques, introduction and development of resources, etc. Research results can be used in the production immediately.

- Sound and efficient circulation system of flowers

Dutch flower circulation system includes 7 large auction market, nearly 800 wholesaling firms and 14,000 retail stores. 80% of Dutch flower exports are completed by auction market, which is the

main channel of Dutch flower sales. For example, flower auction market “Aalsmee” owned by the auction company “FloraHolland” is well known as “Wall Street” of the flower industry transaction. Auction markets connect farmers with large wholesalers and export companies. Auction markets implement the integration and one package service for flower preserving, packaging, quarantining, customs, transport and settlement, thus ensure the transaction flowers appearing in the flower shops around the world at that night or on the following day.

- Perfect innovation and protection mechanism

Innovation is the root cause of the Dutch flower sustainable development. For example, originated in China’s Tibet, tulip had only 150 natural varieties formerly. After centuries of cross-breeding, now it has more than 3000 varieties. Dutch government attaches great importance to cultivation of new varieties and rights protection. In addition to quality control and provide appropriate subsidies to new variety cultivation, the government also specially set up a committee of Dutch Plant Variety Rights to be responsible for breeding new varieties and rights protection issues. For example, the Dutch government requires producers that they can not produce and sell the flowers until they get the license and pay the fees to breeders. Such a mechanism ensures continuous innovation and development of the Dutch flower industry

- Strict quality control system

Dutch quality control agencies adopt measures, such as improving quality control institution, enacting strict quality standards, implementing quality certification system and product quality reputation, etc. , to ensure flowers quality. According to the Agricultural Product Quality Act, intermediary organizations of flower enact the quality standards of different varieties. After the actors get the quality certificate issued by the corresponding agency, the product can be traded. As the Netherlands adopted strict quality assurance measure, its floral products is always invincible in the global competitive market.

3.4 Rural cluster in Poland

Located in north-central Central Europe, Republic of Poland is a medium-developed industrial and agricultural country. The agricultural population accounts for about 25% of the total population, and the agricultural laborers accounts for 27% of the total labor force. The agriculture production value accounts for 19% of the gross national product. The agriculture is based mainly on planting and husbandry. The main crops are cereals (wheat, rye, barley, corn, etc.), potatoes, fodder crops,

sugar beet, rapeseed, vegetables (cabbage, carrots, onion, cucumber, tomatoes, etc.), fruits (apples, berries) and flowers. The animal husbandry in Poland is more developed with the output value accounting for about half of total agricultural value. The farmers raise cattle, pigs, sheep, horses and chickens.

As a member country of European Union, the accession to the EU since 2004 has created a lot of new opportunities for Poland in improving its rural areas (Urszula Bronisz & Wim Heijman, 2007), for instance, *providing farmers with reasonable standards of living, consumers with quality food of fair prices and preserving rural heritage* (EU, 1997). Meanwhile, to take a place in the enlarged European Union and the world market, Poland needs to find ways to improve its competitive advantages. In enhancing competitiveness and growth, clusters play an inevitable and prominent role (Michael E. Porter, 2000). Although “clustering” as a concept or economic theory is unfamiliar to many people, when put into practice, citizens of Poland obtain profitable results and a high level of achievement (Barbara Szymoniuk, 2003). Fostering strong agricultural clusters is important for both the authorities and local farmers.

During our study, we found that agricultural production industry (i.e. fruits, vegetables, meat, herbs, hops and wheat), agritourism and producers cluster are three typical clusters related to countryside and agriculture in Poland. For the first two types, we will chiefly take the Lublin region as an example and take Mazovia Province as the example for the third type.

● Groups of Agricultural Producers in Poland

Groups of agricultural producers have been developed in Poland for two main reasons: to increase agricultural productivity and to improve the situation of farmers (OECD , 2005). There are about 110 groups in the Lublin region (Barbara Szymoniuk, 2003)(The Lublin region, which is in south-eastern Poland and contiguous with Ukraine, is dominated by rural areas, namely 54% of its residents live in the countryside. (OECD , 2005)). The groups are legal and official organizations whose main aim is providing support to farmers and marketing its products and services. As forms of a cluster-structure, the organizations often cooperate with universities and other institutions, and also work on obtaining quality certificates for their products (OECD , 2005). Clusters working there are consisted most of fruit and vegetable producers. Their clients for the most part are domestic and international supermarkets and wholesalers. A key to their success is that they are

capable of providing huge amounts of standardized quality. It is not possible for a single farmer to achieve such a success and level of profit; conversely it requires the dynamics of a group. As a unit, farmers are able to establish modern storage facilities and refrigeration warehouses, as well as quality assessment procedures. These clusters allow add value to the fruits and vegetables by creating more processed goods beyond the basic line, such as conserved, sliced or peeled fruits and vegetables, frozen products, etc (Włodarczyk A.,2002).

● Agritourism Clusters in Poland

Agritourism is defined as *“A network of related businesses in close geographic proximity with market identity and distinctive business culture who follows a common vision, strives for continuous innovation and works closely with local institutions and organizations; May be an informal producer group who cooperates to promote and implement a single special event to a formal association or cooperative led by a board of directors for year-round efforts”*(Szymoniuk, et al, 2004). Agritourism has a long tradition in Poland: it used to be colloquially called “vacation under the pear tree”. In Poland, as in other European countries, agritourism has a good prospect to continue growing. One classic kind of agritourism cluster is the local associations of agritourism farms. In Lublin region, there are 11 such associations which are belong to the Polish Federation of Rural Tourism “Hospitality Farms” (Barbara Szymoniuk, 2003). There are about 5000 agritourism farms in Poland and nearly 2000 of them are members, which may be considered as core of agritourism clusters. The local associations provide many joint activities for their members. These activities include marketing, development of quality standards, lobbying and fundraising (OECD , 2005).

Marketing activities of agritourism clusters include:

- designing a district tourist offer of a specifically local character, embracing folk art, rituals, local cuisine, cultural monuments or natural wonders;
- development of local infrastructure and provision of new tourist services (rentals of sports equipment, camping sites, ski-lifts, bicycle paths, scenic views, pharmacies, post offices, Internet access),
- promotion, including attendance in domestic and foreign trades and exhibitions.

A big advantage of agritourist farms and associations is that they have the potential to activate

country women, no matter what age or educational status they are, thinking of ways to earn money. Thus women's traditional skills and knowledge, such as household, traditional cooking, handicraft, folklore, etc., are appreciated.

In Poland, although competitions exist among the member farms, they are enthusiastic to cooperate, for example in coordinating their specialization, investment plans or mutual assistance. The cluster is also connected with other bodies informally, such as neighboring farms (which provide visitors with local products and additional services), museums, the Regional Centre for Agricultural Consultancy, and church organizations (Humaira Irshadd, 2009).

- The Heart of Poland – agricultural clusters in Mazovia Province

Another example of creating a network of actors and cluster structures is Mazowsze Province (Mazovia). This province covers an area of strict agricultural and well-industrialized Warsaw agglomeration. In a natural way provides a basis for its formation. As in the region of Lubelskie in Mazovia are very well developed producer groups such as the dairy industry and horticulture. In Mazovia can be found three types of agricultural clusters:

- based on an organized market,
- based on the manufacturers and the food industry,
- based on tradition.

The basis for the producers of fruits and vegetables and flowers in the vicinity of Warsaw (Polish capital and the second after the Silesian agglomeration in Poland) is an agricultural wholesale market in Bronisze. It opened in 1999. Market for agricultural products is concentrated around 1000 producers and c.a. 450 traders. The annual turnover is 1.1 million tons of agricultural products [24], (Shah M. & Koziol W.,2011).

The second group of cluster structures results from the location of the key enterprises in food industry - this is the north-east and the west region - the dairy industry (the largest company of its kind in this part of Europe based on the legal form of cooperatives, which suppliers are the owners). This also applies to producers of apples around the concentration of food establishments in Tarczyn (in the center of the region) (Koziol W., 2009).

The third group refers to the concentration of traditional agricultural producers. Her examples are the producers of strawberries in north-western part of the province and the producers of apples in the vicinity of Grójec and Białobrzegi (central region). It should also pay attention to the new

found in other industries the effect of imitation. It is the case for concentration of pepper crops in about Przysucha (central region) (Tchorek G.,2009), (Zalewska M.,2009), (Koziol W., et al, 2008) .

4. Summary about the selected countries

According to the introduction of the above 4 countries, we find the formation and growth of typical international agricultural clusters have same fundamental rules. Agricultural cluster is a certain stage during the developing of agricultural industrialization , and it is not the foolproof aggregation of homogeneous enterprises.

4.1 Resource endowments is the material basis for survival and development of agricultural cluster

The experience of International agricultural cluster manifests that the traditional material resources are the basis of competitive advantages. The resource endowments, such as terrain, climate, agrotypes and water source effects the output, quality, cost and type of farm produce seriously, then influences the formation of agricultural clusters. For example, wine cluster in Burgundy of France, corn cluster in United States and flower cluster in Netherland are all in the area with a lot of sunshine, abundant rainfall and delightful weather. Without advantageous resource conditions, agricultural cluster will lose the foundation of survival and development.

4.2 Geographical concentration is the main feature of agricultural clusters

Before site selection, enterprise should balance the three factors: sources of raw materials, producers and market places (ZHOU Xinde, 2008). The three places with the shortest distance and the region with lowest transportation fees will bring remarkable geographical advantage to clusters, and it will be apt to aggregate linked actors, then enlarging the scope of clusters and forming scale of economy. For instance, Dutch flower cluster and Poland's milk and apple clusters obtain the geographical advantages by approaching both the producer and market place; America's corn cluster and wine cluster concentrate on marketing factor; the point of concentration of France's wine cluster is production plants. From the point of view of average number of actors, the amount of actors in France's cluster is more than United States', and in Poland, the scale of agricultural cluster is comparatively smaller than the other selected countries because of its resources and historical factors. Therefore, geographical advantage is the important factor in influencing the

formation and development of agricultural clusters.

4.3 Governmental plans and regulations are external thrust for agricultural cluster

Considered the formation and development of international agricultural clusters, most of them are self-organized, for instance, the Dutch flower cluster does so. There are some other clusters formed by self, but at the same time, governmental regulation and control propel their development effectively. For example, in self-organized wine cluster of France, government detects product quality by strict supervision to avoid market fraud. To ensure the cultivation and promotion of maize hybrid, the U.S. government adopted a series of measures, including carrying out fundamental research of corn breeding; studying the collecting, collating and identifying of maize varieties; and drawing strict regulations on breeding and seed supplying.

4.4 Technological innovation is the fundamental driving force of agricultural cluster development

Scientific and technical innovation is the internality motion in agricultural cluster forming and developing. For example, modern cultural facilities and high-tech are used universally in the practice of Dutch flower cluster, realizing intensive management. In corn cluster of United States, new-high technologies are here, there and everywhere, and the degree of agricultural information is higher than industry currently. The good taste and stability of bacteria of France's wine derive from the combination of traditional technique and modern science and technology. Agricultural technology of Poland is comparatively backward, but in the driven of technological policies of EU Commission, it shows ascending trend.

4.5 Brand is the significant symbol in successful agricultural clusters

Brand is the key element in achieving competitive advantages in international agricultural clusters. The world famous agricultural cluster, such as wine cluster in France and flower cluster in Netherland, both of them have a mutual characteristic, namely created the cluster brand with high influence in the world. Well-known cluster brand can create remarkable comprehensive value, and promoting rapid aggregation of enterprises and achieving further development of clusters (ZHOU Xinde, 2008).

In sum, the comparison of clusters in selected countries is as follows (table 1):

Table1 Comparison of agricultural clusters in selected countries

| Country | Historical influence | Point of concentration | Average number of actors | Way to start (government or self organizing) | Quality control system | Level of technologies used or introduced | Brand effect |
|------------|----------------------|---------------------------|--------------------------|--|------------------------|--|--------------|
| France | traditional | Production plants | many | mixed | high | “medium” Low and high depends on each cluster | strong |
| Netherland | traditional | Markets/production plants | many | Self-organized | high | | strong |
| Poland | traditional | Markets/production plants | less | Self-organized (gov. in selected cases) | low | | weak |
| USA | traditional | Market | medium | Self-organized/government | high | | medium |

5. China’s agricultural clusters

China’s agricultural cluster started late, but it develops rapidly in recent years. Based on local resources, the characteristics of agricultural production, development level of productivity and quality of farmers, the main drivers including rural entrepreneurs, urban technology entrepreneurs, foreign investors, Hong Kong and Taiwan capitalist and state-owned enterprises push to form many agricultural clusters. The basic situation is as follows:

5.1 Agricultural cluster of small town is very common

According to the geographical advantages, a large number of agricultural clusters are built up based on the countryside or township enterprises, and forming specialized small towns. The resources in the network are allocated best. Meanwhile, wastes are used efficiently and environmental pollutions are reduced to a minimum. For example, in the developing of vegetable industry in Shouguang County, Weifang City, Shandong Province, different manufacturers and service companies cluster including vegetable production, vegetable wholesale, seed production come into being gradually, which greatly improved vegetable production within the region.

5.2 High-tech agricultural cluster witnessed initial development

In some developed regions and some areas with agricultural advantages, high-tech agricultural cluster, which relies on science and technology and combines with universities and institutes, is progressively developing. For instance, in Xianyang City, Shaanxi Province, high-tech agricultural cluster of Yangling Agricultural Demonstration Zone is the most representative, which gives full play to the overall advantages of Yangling Agricultural Science and Education, forming three specialty industries including biotechnology companies, green agricultural materials and organic food.

5.3 Distinctive agricultural clusters develop rapidly

With local resources, most of the areas in China extend the industrial chain around the characteristic agricultural products, making the market-based and trade-led agricultural clusters developing quickly. At the same time, through the dragon-head enterprise and linked industries, distinctive agricultural extension model established step by step. For example, the dairy cluster in Inner Mongolia, which is led by dairy companies (Dagula & Kiminami, 2009). There are 110 dairy companies in Inner Mongolia, and almost all of them have contracts with dairy farmers for procuring raw milk. Mengniu Dairy is a private company established in 1997. It has dairy resource bases spread out around the country. It produces 1,500,000 tons of milk annually, and has certifications in standards such as ISO 9001, ISO 14001, OHSAS 18001, CMP and HACCP (Lily Kiminami & Akira Kiminami, 2009).

5.4 Agricultural cluster invested by foreigners and Taiwan traders is established

Some regions with better geographical location or some elements of agricultural production are enhancing the attractiveness of Taiwan capital, thus forming a group of agricultural clusters invested by foreigners and Taiwan traders. For example, Taiwan businessmen invest agricultural industry integrally in Fujian province through upstream, midstream to downstream. In addition to agricultural production, they invest in post-processing, trading, sales and prenatal seed industry, fertilizer, pesticides, agricultural machinery, agricultural products processing machinery and food processing packaging equipment, agricultural equipment, and so on. This type of agricultural cluster promotes the quality and efficiency of local agricultural products (CAO Qingsui, 2010).

China's agricultural cluster develops quickly, but comparing with the above 4 countries, it is still at the preliminary stage. For being short of experience, there are some problems during its development inevitably. Such as lacking of a unified industry management, management of confusion, serious competitions and imitations in same one agricultural cluster; less actors in one cluster and small size of cluster enterprises, simple equipment and low level of technologies, financing difficulties, poor ability to resist risks; indistinctive leading industry and blind configuration of local leading industries (ZHENG Xiaolan, 2009). To solve these problems, China should analysis the current situation of agricultural cluster deeply, study the advanced experiences and achieve enlightens from the relatively-developed countries.

6. Enlightens from the International Development

Looking at the practice and experience of the above four countries, from the perspective of study, China can get the following enlightens to advance modern agriculture development:

6.1 Forming and developing agricultural cluster in a gradual process

The production, growth and improvement of agriculture cluster is a long process and is a result of combined effects of nature, location, technology, market and other factors. It should be based on the development of crop farming and animal husbandry, and have a close relationship with the overall development of the national economy. In U.S., the formation of the major agricultural cluster spent about 200 years, and is still in constant evolution and development process. In this time, the country's industrialization and urbanization level not only opens up a vast market and rich useful means of production for agricultural products, but also impacts the specific pattern of different agricultural cluster from the point of view of demand continuously. The current scale of the France's grape and wine cluster also experienced 4 to 5 centuries of gradual evolution. At present, China's overall economic strength is a far cry from the developed countries, and transport, market and other objective conditions are not perfect, and the layout of agricultural areas, specialized production is also in its infancy. Therefore, the long-term and arduous nature of agricultural cluster construction should be fully understood. Must not be anxious (TAO Huaiying, 2010).

6.2 Making full use of natural resources and implementing the regional division of produce

Any production areas can be divided to the most suitable areas, suitable areas, more appropriate areas and inappropriate areas. China's agricultural cluster should learn from the above selected cases, following the laws of nature, the agricultural cluster located in the most suitable areas and suitable areas can reduce cost and access to economic benefits, then achieving sustainable development. For example, in the United States, corn cluster concentrates in the Midwest; soybean production is mainly concentrated in the flat areas of Mississippi River and the states along the east of the Atlantic coast, where the natural conditions are suitable; the distribution of cotton is mainly in Texas, New Mexico, Arizona and California. Concentration of agricultural production to the small number of large-scale farms can be beneficial to improve the efficiency of land use, to advance the urbanization process, to expand the scale of agricultural operations and agricultural market demand, and to provide agricultural conditions for regional cluster development (GAO Sheng, 2010).

6.3 Enhancing agricultural labor's quality to promote cluster growth

The lasting competitiveness of French wine cluster demonstrates that the quality of labor is very important. France's farmers generally graduate from high school or college. They are expert at agricultural technology, and good at management. Meanwhile, the government focuses on providing training for wine-related technologists. In Poland, aiming at improving the quality of farmers and reducing the gap between rural and urban continuously, the governments directly allocate funds to schools according to the enrollment situation. So the children of farmers benefit from education free of charge from primary school to university (CAI Silong, 2007). In China, to ensure agricultural clusters developing sustainable, the government should improve the quality and moral culture of farmers further, which is the human resource base of agricultural Cluster integrated development.

6.4 Accelerating agricultural cluster development by technology innovation

Technology innovation is the intrinsic motivation of the formation and development of agricultural cluster. An agricultural technology innovation can revitalize an agricultural industry, can make an agricultural industry from small to big, from weak to strong, and can make multiple industries growing to form clusters. For example, in west of Netherlands, the emergence of “glass city” in Westland is inseparable with technological innovation and the support of highly developed professional service system. Draw lessons from the international experiences, by technology innovating, China's agricultural cluster strives for breaking through the constraints of time and space in industry development, enlarging agricultural production areas and the size of cluster boundary, improving the development of transportation and processing to reduce costs, and expanding market space (GAO Sheng, 2010).

6.5 Adopting agricultural credit and subsidy policies to support agriculture

Agricultural credit and subsidy policy is one of the important agricultural policies in many countries, especially in developed countries. Aiming at supporting the agricultural modernization, the U.S. government introduced an agricultural credit program under the situation of rapid development of agricultural mechanization, chemicalization, and scale and dramatic increase of funds needed for production. The French government, after World War II, started to put agricultural investment in national budgets. Focusing on the principles of assuring the important, differentiating interest rates and paying attention to the efficiency, the government vigorously

developed agricultural credit and encourages farmers to develop agricultural mechanization and promote the concentration of lands. Agricultural credit and subsidy policies have a positive effect on compensating the lack of state investment, rapidly expanding production scale of agricultural producers and increasing agricultural production capacity. To give more policy support, the Chinese government is gradually increasing agriculture-related subsidies and promoting stable development of produce and other various items. The purpose is to use more transparent, more direct and firm policies to mobilize and protect the enthusiasm of farmers in agricultural production (TAO Huaiying, 2010).

6.6 Paying attention to play the role of farmer cooperation and civil organizations

Farmer cooperation and civil organizations has become an essential system arrangement in the process of agricultural production. For example, in 20th century, the innovation and development of French agricultural cooperative economic organizations played a key role in improving agricultural cluster development and building advanced modern agricultural system. Path dependence exists in the process of establishing and developing of rural cooperative system, so at the same time of drawing on the experience of other countries, China should be based on local indigenous cultural traditions and make a good use of the existing rural organizations and systems to reduce organizational costs, enhancing the vitality of rural cooperative organizations. Provincial and local governments should take various measures to support the development of rural cooperatives and civil organizations (GAO Sheng & HONG Yan, 2010).

6.7 Building agricultural regional brand to enlarge the influence of clusters

Agricultural regional brand is the driving force of agricultural cluster. It stands for the image of the regional agricultural production and plays an important role to the economic development of the region. It forms the reputation, attractiveness and loyalty of a certain types of produce in the region. As corporate brand and product brand, agricultural regional brand can change the consumer's psychology of consumption preferences, influencing consuming behavior and creating demand by leading consumer to buy the production of the region, thus increasing the visible value of the produce. For example, both the world famous French wine cluster and Dutch flower cluster have a common characteristic that they create a powerful cluster brand in the world. Therefore, brand is the key element of agricultural cluster in achieving competitive advantage and is the important sign of success. During the forming and developing of China's agricultural industry,

regional brand establishment must be focused on greatly (ZHOU Xinde, 2008).

6. Conclusion

Agricultural cluster is an inevitable product of Agriculture industrialization at a stage of development. It has spectacular effects on the growth and evolution of local agriculture and linked organizations, such as pushing forward the development of regional economics, promoting competition strength of cluster enterprises, advancing the specialization of agriculture production and increasing the incomes of the farmers. Extracting advanced experiences from U.S., France, Holland and Poland, China can get some beneficial enlightens. To improve the maturing of China's agricultural cluster, China should form and increase agricultural cluster gradually, full using of natural resources and implementing the regional division of produce, enhancing agricultural labor's quality, promoting technology innovation, adopting measures to support agriculture, paying attention to play the role of farmers cooperation, and attaching importance to agricultural regional brand building.

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