

# A STUDY ON THE ISSUE OF INNOVATIVE INDUSTRIAL CONSTRUCTION AND INNOVATIVE INDUSTRIAL CLUSTER IN BUILDING AN INNOVATIVE NINGXIA<sup>1</sup>

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**Abstract:** To construct an Innovative Ningxia and develop its economy by leaps and bounds, This paper puts forward the necessity and urgency of adjusting and optimizing the industrial structure in Ningxia, it analyses the conclusion and enlightenment of theoretical research on the industrial cluster and the experience and enlightenment of the development of innovative industrial cluster at home and abroad, it points the tendency and the barriers to the industrial cluster in Ningxia, it advances the goal, direction and measures of innovative clusters development and construction in Ningxia.

**Key words:** industrial structure, industrial cluster, innovative industrial construction, innovative industrial cluster, innovative Ningxia

For years, Ningxia has actually expanded the industrial scale in a high speed by a way of extensive economic development. However, the rapid development has worsened the ecological environment and destroyed the natural resources, and the way of extensive economic development must not be useful for the international resources and energy are in short supply, the environmental protection is urgent, the international division of labors is accelerated, the corporation between regions is strengthened gradually, and our government has carried out the strategy of developing independently and building an innovative country. In the competition of regional economy, Ningxia should promote the capability of independent development, build the innovative industry, construct the innovative industrial cluster, make full use of the advantage of industrial groups, speed up the adjustment and transformation of industrial structure, and achieve the leaping development of Ningxia economy.

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## 1. THE NECESSITY AND URGENCY OF ADJUSTING AND OPTIMIZING THE INDUSTRIAL STRUCTURE IN NINGXIA

It is essential to fully understand the necessity and urgency of adjusting and optimizing the industrial structure and the transformation of economic development.

### 1.1 Requirements for achieving the transformation from extensive economic development to intensified economic development

The economy of Ningxia, which focuses on the extensive economic development, has the following features: the production increases in a high speed with high energy consumption and investment and poor efficiency which intensifies the relations between human and land and water, and the pressure of resources environment; the industrial levels is low, the energy and chemical industry has a large proportion in industry, but according to the raw materials and industrial structure, the main chemical industry still relies on mineral resources such as coals, limestone, silica, calcium carbide etc., the chain of resource transformation is short, most of enterprises are in a primary period of relying on resources, and some enterprises are still carrying on a mode of traditional processing industry; the division of industry and the competition are disadvantageous, the over-high production cost and the traditional production mode can not satisfy the needs of modern industrial arrangement, the traditional industrial economy has depressed, and the trade environment may worsened with low extra industrial cost; the low-leveled industry has weakened the capability of scientific researches and badly wanted more research staff, which limited the further development of economy.

### 1.2 Requirements for meeting the needs of modern industrial competition and division

The third science and technology revolution happened since the Word War II, has influenced the current international division of labors and greatly changed the form and tendency of international division of labors, which is mirrored in the rapid development of international division of labors transforming from the old specializing between sectors to the specializing inside sectors. The former industrial division of labors between sectors does not require high technology and quality of goods, and is not suitable for the industrial competition.

Seeing from the situation of industrial development in Ningxia, the industrial development levels of Ningxia is still poor and the structure is not reasonable. The agriculture has a relatively large proportion in the three industries, and the development of the manufacturing industry and the serving industry develops quickly but its scale is small and the scale benefits are not good. This developing mode does not satisfy the need of modern industrial competition and division.

### 1.3 Requirements for the development of innovative industry and industrial cluster

The experience of developed countries has shown that the innovative industrial cluster what feature in technological innovation is the direction and tendency of future industrial cluster, and its formation and growth is a long-termed period.

Considering the practical situation of the development of industry and industrial cluster in Ningxia, the development has obtained a certain scale, but the structure is not reasonable. The industrial cluster is still in the period of formation, and its innovative capability is poor. Besides, so far, the innovative

industrial cluster in the true sense has not yet formed.

In order to find a way to sustaining and high-speed development, Ningxia must adjust the industrial structure, and harmonize the relations between the economic development and nature and resources environment, and balance the development between regions and countries.

#### **1.4 Requirements for building an innovative Ningxia and promoting the leaping development of economic and society in Ningxia**

In order to realize the leaping development and greatly reduce the distinction between Ningxia and developed regions in the east, the local government must act in the spirit of scientific development, build an innovative Ningxia, play a dominant role in the formation and innovation of industrial cluster, provide environmental and institutional support for the innovative industry and industrial cluster, strategically adjust the industrial structure on the basis of technological innovation, fulfill the fundamental transformation of economic growth mode, promote the leaping development of economic and society in Ningxia.

## **2. CONCLUSION AND ENLIGHTENMENT OF THEORETICAL RESEARCH ON THE INDUSTRIAL CLUSTER**

### **2.1 Traditional industry and innovative industrial**

The industrial sectors refer to a group of enterprises manufacturing similar products or substitutional products. The traditional industry bases on the labor dense industry oriented to cost. Its core technology is not advanced, and can not form independent property right and bring the deserved profits with the research and developing expenses, and its profits growth in competition is limited. This kind of enterprises has a poorer innovative capability because of the elusion of risk and cost orientation.

The innovative industry builds and develops the innovative capability as an independent one, strengthens the innovative capability as one providing supportive activities for other fields, and aims at establishment of the core capability and new standards, which is the source of obtaining sustaining competition for enterprises.

### **2.2 Industrial cluster and its construction**

Industrial cluster refer to a group of relative companies and organizations which are close geographically; they are in or related to a specified industrial field, and connected according to the generality and the mutual complement.

The related enterprises in the industrial cluster may or may not exist in certain specific industry, and be close to the related supporting industry. The construction of industrial cluster can be built based on the enterprises cluster inside the same industry or the other enterprises cluster of the related industry.

The experience abroad and domestic proves industrial cluster is an effective strategy for regional development, a forceful way to promote the competitive power, and a tendency of industrial economy development.

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### **2.3 The tendency of the development of industrial cluster -- the innovative industrial cluster**

The formation of the industrial cluster has experienced three phases: the time for the formation of cluster -- informal cluster; the time for the development of cluster -- organized cluster; the time for the mature of cluster -- innovative cluster.

The innovative industrial cluster depends on the share of resources and the mutual complement of advantages, and is driven by the technological innovation. The enterprises involved in the technological innovation in the cluster extend and mix mutually to form a network of technological innovation by a certain system. By reasonably optimizing the resources inside the cluster, the up-to-date technology, the new knowledge, and the advanced industrial arts can be created, spread, introduced, and applied in the different sectors of the cluster, so as to promote the sustaining growth of the cluster economy and the optimization of industrial structure.

### **2.4 Conclusion of industrial cluster theory**

Some research shows the innovative industrial cluster is a process of the mature of industrial cluster, and represents more powerful productive ability and competitive advantages. The innovative industrial cluster is helpful to use the information resource, to carry out innovation of enterprises, to deepen the degree of the cluster development, and to enlarge the scale and influence of the cluster, so as to obtain the regional advantages and the trademark effect. Considering these, the innovative industrial cluster is the most leading, the most creative and the most profitable industrial system in industrial economy. This system profits from the active influence of the government, of the research and service institutions and of the industrial cluster.

The development of the industrial cluster may have the need of technological innovation because of the advancement of specialization of the same industry, and thus may make innovative attempt to meet the needs. The innovation based on the competition may eventually develop into an innovative activity in the industrial cluster. The innovative activity of the industrial cluster can bring opportunity to most medium and small enterprises, and propose a solution for promoting the scientific content of products. Meanwhile, to the medium and small enterprises, the cluster can incorporate the enterprises into an extensive association between users and producers, institutions of knowledge production and sectors of commodity and service production, and impel the innovation and lower the cost. Thus, some scholars think the industrial cluster is helpful to the sustaining innovation.

However, the conclusion made by other scholars who research on the industrial cluster in developed and developing countries shows not all the industrial cluster is the innovative system. To developing countries, the small enterprises are in an inferior position of competition and it is difficult for them to develop and adopt the new technology because the innovative resource is in short and the innovative capacity is limited. This research demonstrates not all of the industrial cluster can make the innovative activity sustained, and the traditional industrial cluster may return to the poor innovative activity mode which orients to cost. Therefore, many studies center on the reasons of innovation barriers or the supportive factors reducing the difficulties. These studies can be divided into three levels:

First, the effect concerning about policies. The current study of innovative system focuses on three factors influencing innovative process: innovation, contact and investment. The developing countries' customs and system arrangement in these three processes are usually unhelpful to the innovative activity. Thus, the industrial policies should handle the corporation between participants, and make the arrangement of the stimulating innovation, and the key is to make sustained and steady policies of industry and property right which can reduce the uncertainty under different circumstances.

Second, the institutional background has impact on the industrial innovation. As an interconnected system, the innovative activity comes from the mutually influenced process between enterprises and

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industries. During the process, the enterprises and organizations mutually influenced, such as industrial associations, research institutions, centers of innovation and productive forces, groups for setting standards, training centers of universities and professions, institutions for information collection and service analysis, banks and other financial department, play an important role in applying the up-to-date industrial arts, the advanced working procedure, and the new organizational forms in economy. Some foreign researches emphasize the political organizations and the social groups play a supportive role in the range of region and nations, in the development of corporation activity, in encouraging the network of industrial cluster to transform to broader innovation and production system.

Third, the factors of participants influence innovation. The steady and vertical connection between consumers and producers can reduce the cost of information and communication, and lessen the risk for developing and spreading new products, decrease the time and expenses to bring an innovative activity in laboratory to markets. The corporation between medium and small enterprises inside the same industry can bring forth collective effect and lower innovative cost. The industrial cluster can also produce positive external effects.

## **2.5 The enlightenment of industrial cluster theory**

The above research analyzed the motive system and effect of industrial cluster' innovative activity in the view of government, enterprise environment and enterprise, and demonstrated the government's direction, the social research and development forces and the steady connection between enterprises may help and promote the innovative activity.

There are four necessary conditions for the development of innovative industry and industrial cluster: the high degree of industrial development; definite property right system and market regulations; the convenient degree of information and space and the accumulating characteristics of resources and environment; the innovative environment provided by the government and scientific research service organizations. The relations between these four conditions are shown as the chart 1.

## **3. THE EXPERIENCE AND ENLIGHTENMENT OF THE DEVELOPMENT OF INNOVATIVE INDUSTRIAL CLUSTER AT HOME AND ABROAD**

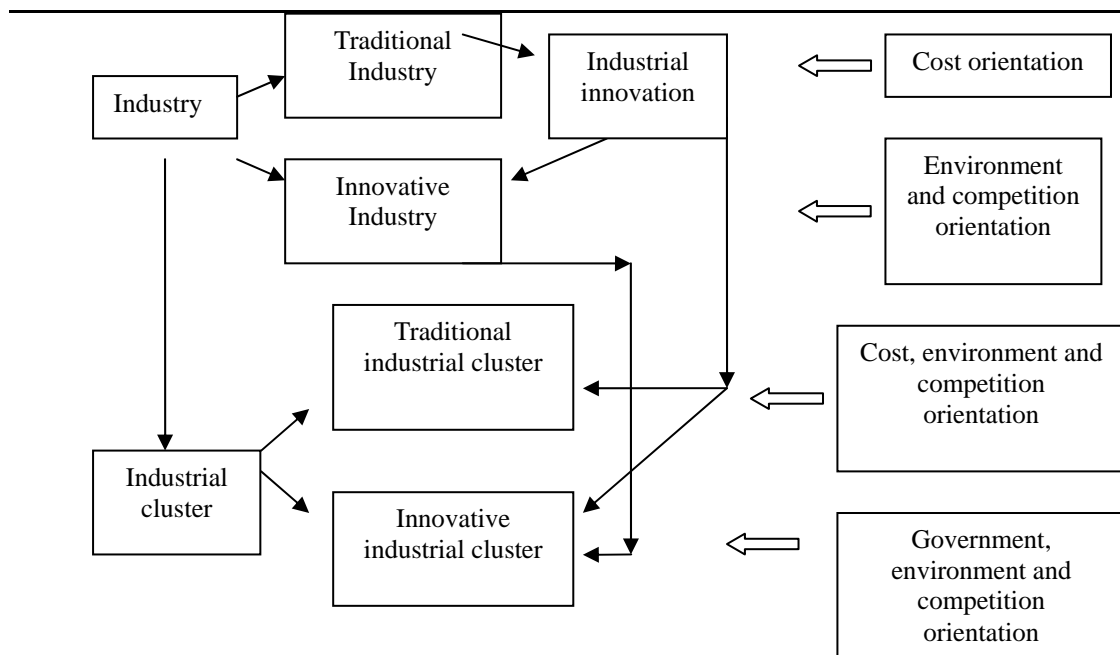
### **3.1 Foreign experience of the development of innovative industrial cluster**

In view of the development of foreign industrial cluster, the success of the hi-tech industrial cluster in developed and developing countries lies in the following common features:

First, inside the industrial cluster, the industry is centralized, the degree of the specialization division and corporation is comparatively high, and the necessary system of corporation is made perfect.

Second, inside the industrial cluster, the technological staff and university and research institutions are highly intensive, and their capacity for independent development is powerful, and the high-tech researches are used in a high rate.

Third, the local government supports the development of industrial cluster, provides better policy environment and more perfect social service system, especially the financial system, the intermediary service system, labor education system and skills training system. But the governmental departments should strictly follow the competitive regulations in the market, and should not take part in the specified production management activity of enterprises.



**Chart 1. The formation process of innovative industrial cluster**

Fourth, build a trade environment which encourages innovation and establishment of new enterprises and lowers the trading cost between enterprises inside industrial cluster.

### **3.2 The current characteristics of the development of domestic innovative industrial cluster**

The current characteristics of the development of domestic innovative industrial cluster are as the following:

#### **3.2.1 Considering the regional distribution, the innovative industrial cluster mainly center on the southeast coastal areas.**

The innovative industrial cluster mainly distribute in the developing coastal areas, especially Zhejiang and Guangdong. Zhejiang possesses most industrial cluster in China. There are only several clusters in the spacious middle and west areas, and their development is commonly poorer than that in southeast coastal areas.

#### **3.2.2 Viewing from the industrial types, the industrial cluster focus on the traditional industry and labor dense industry, and lack of hi-tech industry and capital dense industry.**

In the famous innovative industrial cluster in majority of big cities, the hi-tech industry is dominant, but in most newly appearing innovative industrial cluster, the manufacturing industry especially textile and other light industries is still the main one. Manufacturing industry is dominant in domestic innovative

industrial cluster, and centers on the traditional industry and labor dense industry.

**3.2.3 Viewing from the driven force, the domestic cluster is spontaneous fundamentally, which includes three categories: prototype, embedded type and deriving type.**

Zhejiang is the representative of prototype. The medium and small enterprises of this category finely combine the local advantages and historical and cultural factors. Its development has experienced a process of natural alternation and evolution, and obtained strong life and potential. Guangdong is the representative of embedded type. Its prominent feature is to rely on the geographical advantages, policy advantages and low cost to attract the direct investment from outside enterprises and to build a base of processing and manufacturing industry, and to form the scale of industrial accumulation gradually. Zhongguan Village in Beijing is the representative of deriving type. The research institutions of China Science Institution, Beijing University, and Qinghua University in Zhongguan Village act as the “incubator” of hi-tech industrial cluster. Under the great influence of innovative regional culture, the derivation of enterprises will become the motive of the formation of hi-tech industrial cluster in Beijing.

**3.2.4 According to the distribution of towns and cities, most of domestic cluster become prosperous in the countryside and small towns.**

The domestic industrial cluster originated from the enterprises of countryside and towns in southeast coastal areas, and these enterprises mainly locate in the countryside and small towns.

**3.2.5 Considering the components of enterprises, the domestic industrial cluster is composed of non-public ownership enterprises, mainly the medium and small ones.**

**3.2.6 In the view of growing process, the domestic cluster of prototype comes from the innovation, the modeling, the derivation and the division.**

**3.2.7 The problems existing in the development of innovative industrial cluster are the following:**

unclear understanding to innovative industrial cluster; poorer division and corporation levels of innovative industrial cluster.

**3.3 The enlightenment of the success of typical innovative industrial cluster at home and abroad**

**3.3.1 The government plays different roles in three phases.**

In the process of industrial cluster’ formation, the government should actively take part in the activity, acting as the bridge, the guide and supporter for the medium and small enterprises in the early time; the government should be the protector of environment in the developing period; the government should take few action in the maturing period.

### **3.3.2 The development of the industrial cluster needs the transformation from the industrial policy to industrial cluster policy.**

Industrial cluster policy refer that the government and the related public entities (including big and small enterprises, universities, research institutions, financial organizations, trade associations, intermediary agencies, etc.) should make and execute the policies together to serve for the cluster.

Industrial cluster policy is the combination and extension of local industrial policy, science and technology policy and regional development policy, and its function is to keep and promote the healthy development of the cluster and to bring forth the guiding effect of the cluster so as to make the local economy flourishing. The traditional industrial policy is built on the preferential policies of protecting the market and the big enterprises, and is the government's interference of linear thought, which misguides the fair competition of the market. The industrial cluster policy is different, and it is complicated, netted, dynamic, harmonious and multi-entity.

### **3.3.3 The industrial cluster policy promotes the development of intellectual resource and function of accumulation effect.**

The accumulation of scientific and innovative intellectuals is the key to enhance the competition power of hi-tech industrial cluster.

### **3.3.4 The industrial cluster improves the regional innovation system and furthers the combination of policy-making, production, study and research**

Most of the hi-tech industrial clusters are the production of government's interference and guidance. Universities and research institutions are the expansion and extension of hi-tech industrial cluster's function. The industry is the main force of hi-tech industrial cluster's development.

### **3.3.5 Actively promote the development of innovative medium and small enterprises and accumulation**

The development degree of scientific medium and small enterprises and accumulation decides the competition power of hi-tech industrial cluster, so every government in the world spares no effort to promote the development of hi-tech industrial cluster.

### **3.3.6 Build and perfect the system of risk investment, and improve the financial service**

Risk investment system is the catalyst of the innovation of hi-tech industries.

### **3.3.7 The innovative industrial cluster can cultivate continuous core competition force and realize the sustaining development of industrial cluster**

Seeing from the practice at home and abroad, the independent innovative competence of enterprises decides the competition power of industrial cluster.



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## **4. THE TENDENCY AND THE BARRIERS TO THE INDUSTRIAL CLUSTER IN NINGXIA**

### **4.1 The reveal of the tendency of industrial cluster**

With the reformation and opening, the industry and the industrial cluster has achieved a lot, and the tendency of industrial cluster had shown, such as energy and chemical industry base in Ningdong, the zone of material industry, Yinchuan economy and technology development areas, Great Liupan ecological economy circle. With the execution of the eleventh five-year plan, the industrial cluster in Ningxia will be mature, such as the energy industry, the power and the coal industry.

### **4.2 The barriers to the development of industrial cluster**

The industry of Ningxia has still been weak, small, poor and scattered.

#### **4.2.1 The conditions and weak points for the development of industry and industrial cluster are as the following:**

The infrastructure is still poor, and can not meet the development of industry featuring in resource; the ecological environment is not balanced; the processing capacity of industry is weak.

#### **4.2.2 The industrial cluster is not centered well and its competition power is not strong enough**

The enterprises in Ningxia's industrial cluster are small, and there are few influential leading enterprises in the world. The industrial cluster is not centered, and lacks of the competence to compete with the big enterprises at home and abroad. The labor division and corporation of medium and small enterprises is not specified, and its opening is not enough, and its communication with foreign countries is not adequate. Thus, it is difficult for it to meet the consumers' need to the goods' categories, quality, feature, and low cost. On the other hand, the scale of the enterprises is small and limits the innovative capacity of every enterprise. In 2006, there are only 761 enterprises which have branches in Ningxia, and the average sales profits of every enterprise is 11756 million yuan. There are 641 small enterprises, which has the percentage of 84.23%. Their sales earnings are 3392 million yuan, and get the profit of 37.28 million yuan, which is far less than that of big and medium enterprises.

#### **4.2.3 The level of industry is low, and is not helpful to industrial innovation**

The manufacturing industry of Ningxia centers on mineral and mechanical and electrical industry which depend on energy a lot. The service industry focuses on the traditional service such as transportation and trade. All of these lead to the low industrial level, poor technology, and inferior industrial innovation. In 2006, the farming and fishing and service industry is 2.7% of the agriculture; the output value of traditional industry is 82.7% of manufacturing industry; in the third industry, the output value of the information transmit and computer software industry is 7.67% of service industry, education 8.59%, the scientific research and technological service 2.25%.

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#### **4.2.4 The industry has many types, but is much more scattered regionally, and the relevance between industries is loose**

There are not enough related industries in the province, the production chain is short, and the interaction and cluster effect is poor. The connection and interaction in same industry is not adequate and is not useful for sharing information and promoting proficiency. Thus, the industrial innovation can not get healthy development.

#### **4.2.5 The enterprises' awareness of innovation is weak**

R&D expenses should be 1% of GDP in countries introducing and applying technology, 1.5% in countries having stronger competence of introduction and digest, 2% in countries with advanced development and research capacity. But Ningxia's R&D is only 0.7% of GDP.

The industry of Ningxia depends on natural resource, so the foreign investment enterprises also lack of innovative motivation to better the technology, extend the industrial chains, and enrich the series of goods. This requires the enterprise should improve the standards for development, and invest more in soft wares.

The experience from developed countries and regions shows the active innovative region can not be separated from the innovative attempts of medium and small enterprises, because the small enterprises have not the advantages of cost, market, scale effect and mark effect. Therefore, one of the way to get the existence is to get extra profit by innovation, and transfer the innovative fruits to big enterprises.

Besides, the government should support the development of industrial cluster by helping it to solve the problems encountering by the enterprises.

#### **4.2.6 The enterprises are not competent in developing and exploiting the capital market at home and abroad**

In the process of globalization, the production factors flow and expand in a high speed in the world. International companies take part in the economic activities all over the world. They arrange the resources and production factors internationally, adjust the industrial structure globally and reorganize the profits worldly. Besides, the financial activity becomes global obviously. The development of financial system and capital market and the proficiency of arranging resources may affect the corporation and competition between every entity, and have an impact on every entity's national force and competition power.

Since the end of 2005, the national stock market develops quickly. In 2006 and 2007, the enterprises have collect 14026 billion RMB yuan from the stock market.

According to the statistics, until August 11<sup>th</sup>, 2007, there are 11 companies on the stock market, and their total capital stock is 251964 million shares, the market value 295.74 billion yuan. There is not new company to go to stock market. This can not keep pace with the national capital market.

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## **5. THE GOAL, DIRECTION AND MEASURES OF INNOVATIVE CLUSTERS DEVELOPMENT AND CONSTRUCTION IN NINGXIA**

### **5.1 The Goal of Innovative Clusters Development and construction in Ningxia**

According to its characters in different development stages, the goal can be classified into following: First, from the macroscopic level, increase the supporting and leading role of scientific progress and innovation in forming and developing industrial clusters; increase the contribution ratio of the scientific progress in economic growth. Second, from the medium level, strengthen and improve government's responsibility form of constructing and developing the industrial clusters; give priority to government's leading role in constructing innovative industrial clusters; form innovative industrial clusters under the lead of the government. Third, from the microscopic level, foster a group of innovative enterprises and individuals to form sustainable innovative capacity.

### **5.2 The Direction of Innovative Clusters Development and construction in Ningxia**

Considering the developing trend of industrial clusters, the direction of industrial clusters in future would be innovative industrial clusters. And the formation of innovative industrial clusters is a dynamic progress with constant evolvments. It can be learned from domestic and international experience that innovative industrial cluster is based on intrinsic industrial cluster. According to the practical situation in Ningxia, where the development of industrial clusters remains at the formation stage, the construction and development of innovative industrial clusters should break through from the following aspects:

#### **5.2.1 Construct innovative industrial clusters during the process of forming industrial clusters**

Since industrial cluster in Ningxia is in a forming stage, it is not only strength for industrial redevelopment, but also an opportunity. During this stage, the government can import new resources to cultivate continuous competitive advantage of industrial cluster by adopting innovative mechanism. At the same time, the government should find its right position in constructing innovative industrial cluster and implement new policies to fasten the development of innovative industrial cluster.

#### **5.2.2 Take industrial clusters with specialties as the basis to advance the shift from traditional industrial clusters into innovative industrial clusters**

First, cultivate "five advantages and a new" industrial cluster. "Five advantages" are: coal and electronic power centralized industrial cluster, coal chemistry centralized industrial cluster, rare metal centralized new material industrial cluster, numerical controlled machine centralized equipment manufactory and specialized agriculture industrial cluster. "A new" is information centralized new technical industrial cluster.

Second, use new technology to reconstruct traditional industry. Only in this way, the traditional industry can be refreshed and readjusted. The adaptation of new high technology can strengthen the competitive advantage of traditional industry and expand its developing space.

Third, enforce and promote the development of Ningdong, Yinchuan, Desheng, Wangyuan, Lingwu, Ningxia and Hebin industrial park.

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### **5.3 The Measures of Innovative Clusters Development and construction in Ningxia**

#### **5.3.1 Introduce and promote system innovation for industrial clusters under the lead of the government**

To meet the need of the small and medium enterprises (SMEs) and increase their sustainable innovative capacity, some share-holding or fully state-funded technology development companies should be established in Ningxia, which specialize in operating and developing those innovative resources. Strengthen the Government's guiding role, and actively promote industrial cluster policy innovation system.

At present, there are three major industrial clusters of innovative forms of government responsibility: First, created spontaneously. Mainly through derivative, fissile, imitation and cohesion, and gradually produce a series of the same, similar and related businesses in the area and then gathered in groups. Second, cultivate and develop. Third, plan and develop. The government foster industrial clusters actively and play a leading role.

At present, Ningxia is still in a period of the formation of industrial clusters. In this period, the Government's role is policy guidance and actively supports the development of SMEs.

#### **5.3.2 Breakthrough the innovation plight of SMEs and Introduce innovative resources under the lead of the government**

Since the risk of innovation and investment is higher, SMEs are willing to "free ride" and look forward to the development of others. In this way, they may reduce the R & D investment and innovation to reduce risk. However, if every small and medium enterprise chose this strategy, industrial clusters of innovation will be in a "Prisoner's Dilemma."

Government centralized innovation methods are: First, Advance funds to purchase key technology and equipment. Second, Introduce technology and equipment, including the commissioning of technical equipment, installation, operation, maintenance and use of new equipment. Third, Introduce different channels of different technical resources, through the integration of local government, to form an effective technological innovation capability. Since self-innovation capacity of enterprises in Ningxia is not high, the government-led introduction of innovative sources may lead high social benefits

#### **5.3.3 Adapt operation mode and form innovation capability mechanism**

Ningxia should build a joint-stock or all government-funded technology development company that is dedicated to the development of business and introduction of innovative resources. The aim of this company is to develop new design, new technology and new products through market competition to meet the needs of SMEs. And at the same time, enhance the company's continuous innovation capacity. The advantage of this organization is that corporation is the operation center of innovation resources. The profit motive and the market competition request the company to strengthen its innovation capability continuously.

This innovative organization is positioned in the corporation organization that has entered the normal track of market economy. The difficulty of implementation of such organization design is whether the initial two may transact smoothly. Therefore, the innovative organization should be well-designed by Ningxia local government in the early forming stage of industrial clusters.

First, technical developing company should filter the right technologies based on business-to-market needs. During the process of project selection, those projects such as individual enterprises are unable or unwilling to carry out and the projects have good external spillover effects, should be chosen. The government should understand the technical development of industrial clusters from the perspective that

the public goods to cluster should be provide.

Second, to the selected technical development projects, an open tender should be conducted among scientific research institutions. Only in this way, the advantages of research institutions and key laboratory may be made full of use. At the same time, government may concentrate superior forces and funds to solve the key technical problems that constrain the development of the industrial clusters to improve the overall innovation capability.

Finally, the agreement signed with research units may enhance the conversion rate of scientific and technological achievements.

In the early stage of industrial clusters development, government support is the key of technology transactions. In accordance with its own financial resources, Ningxia can subsidize the price of technology transfer to suppliers or buyers, so that SMEs may afford technology and equipment to develop new products.

#### **5.3.4 Rely on scientific progress, make use of the advantageous superiority and foster innovative industrial clusters**

In order to develop special industries in Ningxia well, it is necessary to persist in relying on scientific and technological progress, emphasis the importance of strengthening the application of science and technology, enhance the conversion rate of scientific and technological achievements, improve the scientific and technological content in industrial and agricultural production, enhance the characteristics of the deep processing of products, and increase the added value of products to realize the transaction of economic growth mode from extensive to intensive.

#### **5.3.5 Stimulate self-innovation of the enterprises and encourage the combination between science and research activity and economic activity**

To improve the intellectual property rights declaration and grant system to ensure property rights against piracy; encourage scientific research institutions and enterprise to engage in innovation and promote capital and human resources into scientific research. At the same time, help research institutions to assume the responsibility of innovation and encourage interaction between enterprises and scientific research institutions. Joint activities should be used to encourage intellectual property conversion, share and optimize the allocation of resources to improve scientific research work efficiency and our region's technological innovation capability. Based on in-depth investigation, the related departments are suggested to formulate appropriate mechanisms and policies.

#### **5.3.6 Intensify the force of enterprise restructuring and make full use of domestic and international capital markets function**

The leading group of the autonomous region should strive to: First, Promote the awareness of allocation of resources and production factors globally to re-adjust industrial structure and develop a capital market to serve local economic and social development. Second, encourage existing 11 companies in stock market to play a positive role and take the lead in the innovative industrial clusters. Third, establish a Ningxia Venture Capital Fund or a fund management company. Fourth, take full use of multi-level capital market system to provide more financing channels and opportunities to develop innovative industrial clusters from different industries, different scale, different types of enterprises.

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