Analysis and Countermeasures of the Innovation and Development of the ChangZhuTan Industrial Cluster

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Abstract. Development of the ChangZhuTan industrial cluster must rely on innovation. This paper from the perspective of the development and innovation analyzes ChangZhuTan industrial cluster status, points out seven problems restricting and hindering the development of industrial clusters and puts forward some corresponding countermeasures for improvement.

Introduction

In the industrial formation and evolution, ChangZhuTan industrial cluster is agglomerated by a plurality of enterprises producing the same, similar or related products in the ChangZhuTan region and Supplemented by the composition of the relevant service supporting institutions, enterprises and other organizations. The enterprises, institutions and organizations in these industrial clusters interact and depend on each other and a complex social system has formed. The innovation and development of ChangZhuTan Industrial Cluster has a great impetus to promote the regional economy in Hunan.

The Outstanding Problems in the Process of Innovation and Development of ChangZhuTan Industrial Cluster

The innovation and development of ChangZhuTan industry cluster has been a scale, the main problems still exist in the following aspects, hindering and restricting the process of innovation and development of industrial clusters.

The High-Tech Industrial Clusters in ChangZhuTan Industrial Clusters Are Still Small

Among the ChangZhuTan 23 industrial clusters, 19 are traditional industry clusters, taking up 82.6%. Changsha, Zhuzhou and Xiangtan city group has been approved by the state as a national high-tech industrial base, focusing on the five fields development of electronic information, new materials, new energy, bio-medicine, civil aviation and aerospace industries. But in these areas, the scaled industrial clusters are still too small, only four have hit scale. At the same time, some industrial clusters are in the low end of the industry chain, and clusters entering the high-end industrial chain with a complete one are small.

The Supporting Industry of Industrial Clusters Innovation Development Is Still Relatively Backward

Although the combination of core enterprises with small and medium-sized enterprises is considered in part of the industrial clusters, the correlation degree is not high, and the local matching rate of the industry is relatively low. In the open market conditions, the core enterprises when in the course of production costs, the purchase of raw materials and spare parts, in addition to the quality and price comparison and measurement, sometimes also need to taken into account of establishing long-term supply and marketing relationship, usually need comparison and selection for procurement in the larger range. Raw materials and accessories wholesale and retailing of the local market matching rate is low, its driven ability and leading role to the small and medium sized enterprises in the clusters and is not enough. It is estimated that the key components and parts
required for main products of the ChangZhuTan major enterprises in the local matching ratio is less than 42%. The main parts and key technologies of construction machinery and other industries rely on foreign products and other provinces products.

**Industrial Cluster Linkage Innovation and Development Is Still Low**

The three municipal governments of ChangZhuTan are committed to the development of the city's own industrial clusters, industrial cluster layout of ChangZhuTan is more dispersed, the problem of homogeneity at different degrees occur, scale economies and scope economic effect are difficult to form. For e.g., the three cities have all formed different scale of the automobile and parts industry clusters, Changsha and Xiangtan have developed the construction machinery, new materials industry clusters. Influenced by "administrative region economy" inertia effect, The ChangZhuTan three urban elements area cross flow, enterprises' off-site migration still encounter a certain degree of difficulty and the industrial cluster cross regional linkage innovation development is not enough, difficult to achieve the effective integration of resources, especially innovation resources.

**The Production Elements Integration of Industrial Clusters Innovation and Development Is Much More Difficult**

"Administrative area economy" model still has considerable inertia, elements of area cross flow, enterprise off-site migration still exist the difficulties brought by the area division, which limits the scope of economic activities of local governments or enterprises, thus it is difficult to realize the resources effective integration. In recent years, governments at all levels have done a lot of work, but some have not achieved the desired results. Industry guidance policy and interest coordination mechanism need to be continuously improved. How to give full play to the policy and planning guidance function? There are still many problems need further research, including: how to screen, cultivate the industries with the potential development and market prospects ; how to increase the support to the high technology industrial cluster; how to promote the production factors flow without barriers; how ChangZhuTan—the three cities according to the comparative advantage to arrange labor division and cooperation, both being the protagonist and a supporting role, to correctly treat possessions matching problems, to guide cluster to extend the industrial chain, improve regional matching rate, leading the development of small and medium-sized enterprises and not artificially limit the enterprises to choose supporting manufacturers, increase the supporting cost, influence the healthy development of clusters.

**The Investment of Industry Cluster Innovation Is Not Enough and the Independent Innovation Ability Is Weak**

ChangZhuTan industrial clusters use the limited number of foreign capital. Some enterprise financing channels are narrow, only taking the development model of self accumulation fund and the development speed is limited. In particular, for some late started private enterprises, due to the small size of assets, it is difficult to get loans from financial institutions. They mainly rely on the shareholders individual's ability to raise funds and company’s accumulation to achieve rolling development. Some remain in the original accumulation or imitation production stage, their product quality and production scale cannot meet the requirements of the cluster, cannot play a role in the industrial chain extension and improvement process of clusters. At the same time, the independent innovation ability of ChangZhuTan industrial cluster needs to be improved. In the non-ferrous metal industry research, the most fundamental reason for restricting industrial upgrading is the technical bottleneck, some key technologies have not yet been innovated, making industrial technology upgrade slowly. Zhuzhou Cemented Carbide group takes the position of the first global production, but the average price per ton of her products is only ten percent of international well-known enterprises Sandvik, the reason is that the products are the middle and low grade products. Cemented carbide industry development needs support of professional R&D institutions with strong capital, first-class talents, otherwise the enterprises lack the resources of core technology and cannot narrow the gap with the international advanced level.
Public Platform Service System Construction Is Lagging Behind

ChangZhuTan related public infrastructure and resources sharing platform construction level also cannot well meet the needs of industrial clusters innovation and development, the region does not form perfect and unified open factor market for industrial clusters innovation and development. The intermediary service system is not perfect to match clusters development, the intermediary service institutions for the industrial cluster development in credit guarantee, risk investment, legal advice, technical extension are insufficient, as well as the lagging behind development of industry associations, force some enterprises to be fragmented. Enterprises are unable to reduce the transaction costs in the production and operation, can’t really enjoy the scale effect of accumulation. In particular, the intermediary service institutions and their structure for venture capital, technology incubation and international trade, the strength of cluster development intervention is not enough, the integrity and sincerity service awareness is weak, the personalized service and comprehensive service ability is not strong. It is difficult for the service institutions to provide development strategy selection, information resources research, product variety design, expand overseas markets and professional managers hunting service etc. for different types of the enterprises in the cluster, difficult to coordinate and solve the cluster enterprise communication and orderly management problems.

The Internal Management Mode of Industrial Cluster Innovation Development Needs to Be Improved Urgently

With the rapid development of industrial clusters, the problem of system construction within the industrial cluster has become increasingly prominent. Because the enterprises of the clusters do not attach great importance to the construction of the internal communication channels, the formulation of the operation rules in the clusters and the cluster culture construction adapting to the industrial development, the problem lies in the honesty, generous, open, interactive, win-win social and cultural atmosphere being not thick, being not very good handled the conflicts of interest among the enterprises in the cluster and relationship between enterprises own development and cluster overall growth after the enterprises of the clusters get together in regional concentration. Under the condition of mutual supervision difficulty and information asymmetry, some of the individual enterprises illegal business behavior leading to the internal clusters trust loss, artificially improves the transaction cost and does harm to the whole interest of the clusters. At the same time, the low level trust becomes the obstacle of cluster’s further deep labor division, cooperation and the industrial chain improvement, restricting the innovation and development of the cluster.

Countermeasures of Promoting the Innovation and Development of the Industrial Cluster

To Promote the Common Development of Industrial Clusters in a Professional Industrial Park

Industrial Park as an important carrier of industrial clusters, under the guidance of the overall planning and industrial policies of the park, makes the enterprises gradually gather, park construction and industrial clusters construction promote each other, forms a common development situation. For eg: Changsha has formed a unique "two zones six gardens" with the core of the state-level high-tech Industrial Development Zone, economic and Technological Development Zone, Yuelu Mountain University Science and Technology Park, Liuyang Biomedical Park with its own unique characters distributed and scattered along State Road 319. The Changsha high tech industrial district under the jurisdiction of "one zone four gardens" with the four industry clusters of advanced manufacturing, electronic information, new materials, bio medicine, the total income has exceeded 35 billion yuan for the first time in 2015 high tech Zone, the contribution rate is 27% to the Changsha city's industrial growth, the total economic output is ranked 19 in the 54 national high-tech zones, takes the position of No. 2 among the central provinces nine state-level high-tech
zones. Xiangtan hi-tech Zone as a national Torch Plan characteristic industry base with the nature of Xiangtan electro-mechanical integration, as a national new energy high-tech industry base, in the process of high-tech industry clusters formation, at the same time, the park's economic development momentum is strong, the economic indicators such as its main business value added, high technology output and output strength per unit area are in the forefront among the 32 central provincial-level high-tech zones.

**To Cultivate and Promote the Rapid Growth of Small and Medium Sized Enterprises**

With the growth of industry cluster, the professional division of labor within the cluster is further refined, the agglomeration of environmental conditions and cost advantage in the industrial cluster attract related small and medium enterprises and industry chain to gather in the cluster, at the same time create a good ecological conditions for small and medium-sized enterprises to accelerate hatching. The large-scale backbone enterprise groups in industrial clusters by many ways of setting up small businesses, separating the main industry from the auxiliaries, diffusion of product parts and components, asset restructuring to the fission of a group of supporting small and medium-sized enterprises matching their production, which further expands the enterprise scale and improves the industrial chain. Such as Zhuzhou Electric Locomotive Company, a number of supporting enterprises recently hatched: Nine square steel structure, Nine square electrical appliances, Nine square mold, Nine square coating; the 18 subsidiaries hatched out of the Age Group such as the Age new materials, Age electronics, and Age electricity.

**Optimization and Upgrading of Industrial Structure to Promote the Innovation and Development of the Industrial Cluster of ChangZhuTan**

With the development and growth of industrial clusters, the optimization and upgrading of the industrial structure has also made positive progress, the specific performance are in the following aspects.

1. The level of industrial structure evolves to high-end. Through enterprises joint restructuring, relocation, park agglomeration and joint cooperation, it has promoted the system reform and mechanism conversion, improved the technological upgrading and varieties, scale production and coordinated development. The above scale enterprises, especially large backbone enterprises have played a strong supporting role on the economic growth, giving a vigor and vitality for the development of the industry. Such as enterprises in general use, special use, transportation and other equipment manufacturing and so on in ChangZhuTan equipment manufacturing industry which make the regional industrial gravity center shift from labor-intensive industries to technology and capital intensive industries, and keep the structure of heavy industry as the main body.

2. Industry concentration has been gradually increased. According to the economic census data in 2015, the main business income of the top 10 industries in the ChangZhuTan cities has similarities and differences, in which chemical materials and chemical products manufacturing industry, general equipment manufacturing industry and other two industries are almost completely the same. From the perspective of location quotient to get the result of industry concentration degree (comparing to the location quotient of the province's industrial structure, if it is greater than one, i.e.it has the phenomenon of industry agglomeration,)the industry concentration in Changzhutan has increased from 16 industries in 2008 to 23 industries in 2015 including black metal mining industry (2.48), communications equipment, computers and other electronic equipment manufacturing industry (2.12).

3. High-tech industries have a strong growth potential. In the development of high and new technology industries, based on the highly intelligent-intensive and open environment, Changzhutan fully absorbs the advanced science and technology resources and capital investment inside and outside of the region. Using modern means of management, through the implementation of preferential policies and reform measures of high and new technology industry, the established high and new technology industry development zone has realized local optimization of the hardware and software environment, has accelerated conversion of the scientific and technological achievements.
into practical productive forces. It is formed the Changsha area focusing on the advanced manufacturing, electronic information, biological medicine and new materials, Zhuzhou focusing on the prominent new materials, advanced manufacturing, biological medicine and new energy, Xiangtan focusing on the choice of new materials, advanced manufacturing, new energy and high efficient energy saving as a breakthrough in the high and new technology industry development zone structure.

**Productive Service Industry and Industry Associations Are the Necessary Conditions for the Innovation and Development of Industrial Clusters**

The various enterprises forming a cluster, as an independent production unit, feel difficult to solve many of the production operation problems with their own abilities so they require social professional services. For e.g., the financial services provided for solving the difficulty of financing, aim to reduce the transaction cost between enterprises inside and outside the clusters, to set up formal intermediate goods market system, favorable to improve geographical agglomeration effect of the logistics center, and regularly organize staff members to take part in the professional and technical training services. So the related productive services become the market resources adapter to solve the difficulties of enterprises and improve operational efficiency. Once the industry develops to a certain stage, with the promotion of the product added value and the market competitiveness, needs more support of productive services. At the same time, the Industry Association and cluster agency coordination institutions with the compound function of helping enterprises handle with various trade friction and barriers, collect market information, integrate production resources, regulate the operational behavior, prevent industry speculation and coordinate the cluster interest, has its own unique and irreplaceable role in the process of innovation and development of industrial clusters.

**Government Industrial Policy and Regional Construction Planning Guide the Future Development of Industrial Clusters**

The inherent defects of the market mechanism and the spatial characteristics of the regional economy make it difficult to ensure that the ChangZhuTan industrial clusters can be rapidly developed along the optimal path only depending on the market power. Innovation and development of industrial clusters, as an important part of the new industrialization strategy, needs the government's generous support to guide industry development, create the development environment, provide public services, speed up the construction of the park and to construct the innovation system. Such as under the guidance of the scientific concept of development, the government organizes experts, from a higher and updated perspective to treat the cluster development issue, on the basis of analyzing and judging the inherent law and development trend in the future of regional industrial clusters innovation and development, carefully prepare and edit the industrial cluster development and innovation planning, which has extremely important guiding role on the development of the industry. A series policy regulating industrial clusters formulated by the Government, including promoting market competition rules, policies to encourage the risk investment, financial policy incentives for the cluster development, intellectual property policy for innovation protection, policy of products production and processing standards and certification policy, and policies for the protection of consumer interests, to create a fair and orderly competitive market environment for the innovation and development of industrial clusters. Governments’ investment and construction of all kinds of industrial parks and public goods related such as information network, the development of productive service industry, industry associations and cluster agency support, and cooperation push industry-university-research cooperation and innovative culture atmosphere will be good for the growth of industrial clusters.

**Summary**

ChangZhuTan Industrial Cluster’s development and innovation should rely on the government's
industrial policy and industrial planning guidance and support, and cooperation of the infrastructure construction, economic environment and social environment. In the major innovation system composed of government, industry, universities and research institutions, a new innovation system should be set up and perfected for the improvement of the local conditions of ChangZhuTan. Vigorously introducing industrial clusters with high scientific technology content and powerful innovation ability, and continuously improving the independent innovation capability of local industrial clusters, accelerating the process of industrial upgrading and transition to a new type of industrialization.

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Reference