



Comparative Analysis of the Construction of Scientific and Technological Innovation Centers in China

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Abstract. Leading the in-depth implementation of major regional strategies with the layout of science and technology innovation centers is of great significance for supporting national science and technology self-reliance, building a new development pattern and promoting regional coordinated development. By summarizing the construction of science and technology innovation centers in Beijing, Shanghai and Guangdong-Hong Kong-Macao Greater Bay Area, this paper analyzes the unique advantages in geographical location, innovation foundation and policy support in different regions, and summarizes the construction experience and typical characteristics of these science and technology innovation centers.

Keywords: Construction of Science and Technology Innovation Centers, Comparative Analysis, Construction Experience, Typical Characteristics.

1 Introduction

A new round of scientific and technological revolution and industrial transformation is booming, which promotes the continuous adjustment and reconstruction of the world division of labor system and innovation pattern, and provides a catch-up opportunity for China's scientific and technological innovation and leap-forward development. After years of rapid development, China's science and technology and economy have laid a solid material foundation for building a global science and technology innovation center. Since the 18th National Congress of the Communist Party of China, China has built three international scientific and technological innovation centers, namely, Beijing, Shanghai and Guangdong-Hong Kong-Macao Greater Bay Area. Based on the basic conditions such as resource endowment, industrial characteristics, location advantages and development level, all localities have highlighted their advantages, guided by the strategic positioning of the regional science and technology innovation center, and started with building a strong scientific research system, a complete technological innovation system, a highly competitive high-end industrial system and an open and first-class innovation environment system, exploring their own unique innovation-driven development models, and have gradually planned and

formed a development pattern with clear orientation, clear functions and standardized order^[1].

2 The Typical Practice of Science and Technology Innovation Center Construction

2.1 Typical Practice of Beijing Science and Technology Innovation Center Construction

(1) Construction situation

The first is the geographical advantage. Located in the core of Beijing-Tianjin-Hebei region, as the capital of China, it is the national political, cultural and international exchange center. Its transportation network radiates across the country and is closely connected with the whole world, with dense international airport routes, which can conveniently realize personnel exchanges and material transportation at home and abroad, help gather global innovation resources, promote cross-regional and cross-border scientific and technological exchanges and cooperation, and make Beijing an important hub for scientific and technological information exchange at home and abroad^[2].

Second, the innovation foundation is solid. The quantity and quality of scientific research institutions are second to none in China. China Academy of Sciences, China Academy of Engineering and many other state-level scientific research institutes are located here, gathering a large number of top scientific research talents, and have made many pioneering achievements in basic scientific research such as mathematics, physics and chemistry, as well as cutting-edge technology research and development such as quantum communication and artificial intelligence, leading the domestic scientific research direction. Higher education resources are highly concentrated, and there are many world-renowned universities such as Peking University and Tsinghua University. These universities have a complete range of disciplines and strong scientific research strength. They have not only trained a large number of high-quality scientific and technological talents, but also undertaken a large number of national-level scientific research projects. They have profound accumulation and extensive influence in academic research and technological innovation, providing a steady stream of intellectual support and innovative ideas for scientific and technological innovation. The cluster effect of high-tech industry is remarkable, and a large number of high-tech enterprises are gathered in the science and technology park represented by Zhongguancun. It covers almost all emerging technical fields from electronic information and biomedicine to new energy and new materials, forming a complete industrial chain and an active innovation ecosystem^[3].

Third, policy support is strong. At the national level, great attention has been paid to it and policies have been tilted, and a series of policy documents have been issued specifically for the construction of Beijing Science and Technology Innovation Center. In the management of scientific research projects, simplify the application process, increase capital investment, and set up a variety of special scientific research

funds, such as the key projects supported by the National Natural Science Foundation of China for universities and scientific research institutions in Beijing, to provide sufficient research funding for researchers. The talent introduction policy is very attractive, which opens up a green channel for high-end scientific and technological talents, provides convenient settlement procedures, high housing subsidies, high-quality educational resources for children and other preferential conditions, and attracts top scientific and technological talents from home and abroad to gather in Beijing, greatly enriching the innovative talent team in Beijing and enhancing the innovation vitality and competitiveness [4].

(2) Construction experience and typical characteristics

First, innovative resources are highly concentrated. With the advantage of the capital, Beijing attracts high-quality scientific research institutions, universities and enterprises from all over the country and the world, forming a huge and intensive gathering place of innovation resources, which has produced a strong knowledge spillover effect and innovation synergy effect, enabling scientific and technological innovation activities to be carried out efficiently, and new ideas and technologies are constantly emerging and spreading rapidly. Second, the leading role of scientific research is outstanding. It has always been at the forefront of China in basic research and frontier technology exploration, and many national scientific research projects and achievements have been born here, which has provided direction guidance and technical support for national scientific and technological innovation, played a strong leading role in scientific research, and promoted scientific and technological progress and industrial upgrading in related fields in China [5].

2.2 Typical Practice of Shanghai Science and Technology Innovation Center Construction

(1) Construction situation

The first is the geographical advantage. Located at the mouth of the Yangtze River, it is the economic center and international metropolis of China. Its coastal location makes it an important window for China's foreign trade and international exchange. It has a world-famous port and a developed shipping industry, which is convenient for trade and scientific and technological cooperation with other parts of the world. At the same time, Shanghai is at the core of the Yangtze River Delta Economic Zone, which can form close industrial synergy and innovation linkage with neighboring cities, and radiate the economic development and scientific and technological innovation of the whole Yangtze River basin.

Second, the innovation foundation is solid. The strength of higher education and scientific research institutions is strong, and Shanghai Jiaotong University, Fudan University and other universities enjoy high reputation at home and abroad. These universities have carried out in-depth research work in engineering technology, medicine, material science and other disciplines, and have a number of national scientific research platforms and laboratories, such as Shanghai synchrotron radiation light source and other large scientific devices, which provide advanced experimental conditions and technical support for basic research and cutting-edge technology research

and development. The industrial base is diversified and high-end. In high-end manufacturing, automobile manufacturing, aerospace, shipbuilding and other industries are advanced in technology and internationally competitive. In the field of financial technology, relying on Shanghai's status as a financial center, financial technology enterprises have flourished, which has promoted the innovation and upgrading of financial services; In the field of biomedicine, Zhangjiang Hi-tech Park has gathered a large number of well-known biomedical enterprises and R&D institutions at home and abroad, forming a complete industrial chain from drug research and development, clinical trials to production and sales, and innovative achievements are constantly emerging.

Third, policy support is comprehensive. The Shanghai Municipal Government has actively promulgated a series of policies and regulations to promote scientific and technological innovation, such as "Regulations on Promoting the Construction of Scientific and Technological Innovation Center in Shanghai", which provides all-round protection and norms for scientific and technological innovation activities from the institutional level. In terms of technology and finance policy, we should set up a fund pool for science and technology credit risk compensation, encourage banks and other financial institutions to increase credit support for science and technology enterprises, and broaden financing channels for science and technology enterprises; In terms of industrial support policies, tax incentives and land supply incentives are given to emerging industries to promote the cultivation and development of emerging industries; In terms of talent introduction policy, the talent points settlement system is implemented, and the points are evaluated according to the multi-dimensional indicators such as the qualifications, skills and scientific research achievements of talents, which provides convenience for all kinds of innovative talents to settle down and attracts a large number of high-quality talents to flow into Shanghai.

(2) Construction experience and typical characteristics

First, the deep integration of industry and technology. Shanghai gives full play to its industrial advantages, deeply integrates scientific and technological innovation with high-end manufacturing, financial services and other industries. Through industrial demand, scientific and technological achievements feed back industrial upgrading, forming a virtuous circle, promoting the high-end, intelligent and green development of industries, and improving the overall economic strength and international competitiveness of the city. The second is the ecological construction of international innovation. With its status as an international metropolis and superior geographical location, Shanghai actively attracts international innovation resources, conducts extensive scientific and technological cooperation and exchanges with scientific research institutions and enterprises around the world, and builds an international innovation ecosystem. In this system, the international advanced technology, ideas and talents keep pouring in, which promotes the promotion of local innovation ability and the international development of innovation culture.

2.3 Typical Practice of Guangdong-Hong Kong-Macao Greater Bay Area Science and Technology Innovation Center Construction

(1) Construction situation

The first is the geographical advantage. Located in the southern coast of China, it covers Hongkong, Macao Special Administrative Region and nine cities in the Pearl River Delta. Hong Kong is an international financial, shipping and trade center, Macau is a world tourism and leisure center and a service platform for business cooperation between China and Portuguese-speaking countries, and nine cities in the Pearl River Delta are important manufacturing bases in the world. The transportation infrastructure in the region is complete, and major transportation projects such as the Hong Kong-Zhuhai-Macao Bridge and the Guangzhou-Shenzhen-Hong Kong high-speed railway closely connect the three places, realizing the rapid circulation of personnel, materials and funds, forming a unique "9+2" collaborative innovation pattern, which is conducive to integrating financial, trade, manufacturing, science and technology resources in the region and building a globally competitive science and technology innovation center.

Second, the innovation foundation is unique. Innovative resources are rich and complementary. Hong Kong has many world-class universities, such as Hong Kong University and Hong Kong University of Science and Technology, which have rich experience and advantages in internationalization of scientific research and protection of intellectual property rights, and their scientific research achievements have a high influence in international academic circles. Macao has a certain foundation and advantages in traditional Chinese medicine research, cultural creativity and other characteristic fields, and has extensive contacts and cooperation channels with Portuguese-speaking countries; The nine cities in the Pearl River Delta have developed manufacturing industries, and have complete industrial chains and strong industrial supporting capabilities in traditional manufacturing fields such as electronic information, household appliances and clothing.

The third is policy support coordination. At the national level, the Outline of Guangdong-Hong Kong-Macao Greater Bay Area Development Plan was issued, which provided strategic guidance for the construction of Greater Bay Area Science and Technology Innovation Center from the top-level design. In terms of talent policy, it promotes mutual recognition of talent qualifications in Guangdong, Hong Kong and Macao, and facilitates the flow of talents. For example, the pilot project of mutual recognition of professional qualifications in Hong Kong and the Mainland has promoted the free flow and collaborative innovation of talents in the three places; In terms of scientific and technological cooperation policies, universities, scientific research institutions and enterprises in the three places are encouraged to jointly carry out scientific research projects and jointly build a scientific and technological innovation platform, such as the construction of a joint laboratory in Guangdong, Hong Kong and Macao, which has achieved resource sharing and complementary advantages; In terms of financial policy, we support Hong Kong to give full play to its advantages as an international financial center, and provide diversified financing channels for Greater Bay Area's scientific and technological innovation, such as pro-

moting the cross-border wealth management business pilot in Greater Bay Area, which has broadened the investment and financing channels for scientific and technological enterprises and residents.

(2) Construction experience and typical characteristics

The first is a model of regional collaborative innovation. By breaking the administrative barriers of the three places, Guangdong-Hong Kong-Macao Greater Bay Area has realized the coordinated integration and complementary advantages of resources in the region. Collaborative cooperation in talents, science and technology, finance and other aspects has given full play to the respective advantages of Hong Kong, Macao and the nine cities in the Pearl River Delta, and formed a strong collaborative innovation force, providing useful experience for solving institutional and institutional obstacles in cross-regional innovation cooperation. Second, multiculturalism drives innovation. Multi-cultures in Greater Bay Area blend and collide with each other, which stimulates innovative thinking and vitality. Talents from different cultural backgrounds gather here, bringing diverse innovative ideas and methods, promoting the cross-border integration and development of scientific and technological innovation in different fields and industries, and making Greater Bay Area have unique advantages in the transformation of scientific and technological achievements and the cultivation of emerging industries.

3 Conclusion

At present, China has formed the strategic layout of three international scientific and technological innovation centers, namely, Beijing, Shanghai and Guangdong-Hong Kong-Macao Greater Bay Area, which strongly supports China to enter the ranks of innovative countries. In the new era, the international situation is increasingly severe and complicated, and the international competition is more intense. Accelerating the strategic layout of regional science and technology innovation centers is of great significance to supporting the national science and technology self-reliance, building a new development pattern with the domestic macro-cycle as the main body and the domestic and international dual-cycle promoting each other, and promoting regional coordinated development.

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