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RESEARCH ON THE CURRENT SITUATION OF CHINA'S REGIONAL INNOVATION NETWORK

Research article

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**Abstract**

In recent years, the Chinese government has placed great importance on scientific and technological innovation, as well as regional development. Regional innovation networks have played an increasingly crucial role in promoting innovation, economic growth, and social development. Therefore, studying China's regional innovation networks is of both theoretical and practical significance. Since the 20th century, China's regional economic development pattern has gradually emerged. This paper summarizes the current development characteristics according to the development status of China's regional innovation network through the method of analysis and induction. Although the regional innovation economy has grown rapidly with support from various factors, there are still some problems and deficiencies. This paper not only identifies the developmental problems, but also suggests corresponding solutions to improve the establishment and development of China's regional innovation network. Moreover, it can serve as a reference for other countries and regions seeking to establish their own regional innovation networks.

**Keywords:** China regional innovation network, regional economy, characteristics, problems, suggestions.

ИССЛЕДОВАНИЕ ТЕКУЩЕГО ПОЛОЖЕНИЯ РЕГИОНАЛЬНОЙ ИННОВАЦИОННОЙ СЕТИ КИТАЯ

Научная статья

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**Аннотация**

В последние годы китайское правительство уделяет большое значение научно-техническому развитию и региональному развитию, и региональные инновационные сети играют все более важную роль в содействии инновациям, экономическому росту и социальному развитию. Исследование региональных инновационных сетей Китая имеет теоретическое и практическое значение. С начала 20 века появилась характерная модель регионального экономического развития в Китае. В настоящем документе обобщены текущие характеристики развития в соответствии со статусом развития региональной инновационной сети Китая с помощью метода анализа и индукции. Несмотря на то, что региональная инновационная экономика развивалась быстро под поддержкой различных факторов, все еще есть некоторые проблемы и недостатки. В данной работе, помимо выявления проблем развития, предлагаются соответствующие решения и рекомендации по улучшению создания и развития региональной инновационной сети Китая, что может служить примером для других стран и регионов, стремящихся создать свои региональные инновационные сети.

**Ключевые слова:** региональная инновационная сеть Китая, региональная экономика, характеристики, проблемы, предложения.

**Introduction**

Since China's reform and opening up, the regional economy has undergone comprehensive development. Against the backdrop of economic globalization, the government has placed increasing emphasis on the innovative economy. The creation of regional innovation networks has promoted and enabled the expansion of creative pursuits and local economic development. Despite the progress made in establishing China's regional innovation network, it still faces a few challenges and obstacles. We can propose methods to enhance the economic development of a region by utilizing the characteristics of regional innovation networks.

**Theoretical Basis of Regional Innovation Network**

Freeman initially described regional innovation networks as a form of macro planning for system innovation within a region [1]. Cooke defined it as the presence of formal and informal cooperative connections between innovation entities, such as governments, enterprises, universities, and scientific research institutions within a certain area, and these stable cooperative relationships together construct a stabilized system [2]. Chinese scholar Zhang Yuming believes that regional innovation networks are organizational forms with resource allocation and innovation capabilities, constituted by the participation of enterprises, universities, and other innovative actors who cooperate with each other [3]. Luo Liyuan defines it as a network development model with horizontal connections, in which diverse actors within a specific region adopt new methods of collaboration, promoting the flow of innovation resources to fulfill needs, and ultimately attain the goal of innovation [4].

According to the opinions of the aforementioned scholars, this research defines regional innovation network as a network of interwoven connections among innovative actors including enterprises, universities, research institutions, governments, and financial institutions within a certain regional scope, engaging in innovative activities. In this relational network, the most crucial characteristics are the participants of various innovative actors and the cooperative relationships among them.

Nowadays, many Chinese scholars have focused their researches on China's regional innovation networks. In 2011, Miao Changhong et al. approached the subject from the perspective of economic geography, taking network innovation, regional economy, and human geography as the three main research directions, providing methodological support for the formation of regional innovation economic networks [5]. Wang Shengyun and Wang Zhenhan constructed an innovation capability structure relationship model, measured the innovation capabilities of various provinces in China, and revealed the spatio-temporal evolution of provincial innovation capability coupling networks [6]. Ren Shenggang and Hu Chunyan examined and assessed the connection between regional innovation network features and the capacity for innovation within a region. The above studies indicate that research on regional innovation networks has both theoretical and practical significance for economy [7]. From a comprehensive standpoint, this article primarily examines and recaps the present state of China's regional innovation network, scrutinizes the existing issues, and proposes relevant recommendations.

### **The Development Characteristics of China's Regional Innovation Network**

China has been adjusting its regional economic policies to promote the development of regional innovation economies since the commencement of reforms and opening up. As a consequence, China's regional innovation network has flourished with distinct characteristics, which can be summarized as follows:

1. Prominent regional disparities: China's regional innovation network structure exhibits noticeable discrepancies in the development of the eastern, central, and western regions [8]. According to the 2021 China Regional Innovation Capability Evaluation Report [9], the top five provinces in the comprehensive ranking of regional innovation capabilities in 2021 are Guangdong 65.49, Beijing 57.99, Jiangsu 51.63, Shanghai 46.39, and Zhejiang 44.37, all of which are located in the eastern coastal area; the last five are Qinghai 22.26, Ningxia 21.76, Xinjiang 21.11, Inner Mongolia 19.80, and Tibet 18.07, all of which are located in the western area. The eastern coastal area boasts rapid economic progress and robust technological innovation capabilities, leading to a relatively advanced level of regional innovation network development. Meanwhile, the central and western regions lag behind due to a delayed start and insufficient innovation resources, resulting in an immature establishment of regional innovation networks in these areas.

2. Industrial cluster effect: In certain regions of China characterized by prominent industrial clusters, such as the Pearl River Delta, the Yangtze River Delta, and the Beijing-Tianjin-Hebei region, the industrial cluster effect is evident, leading to a relatively advanced development of regional innovation networks [10]. Among them, the Pearl River Delta represents a crucial hub of the national manufacturing industry, while the Yangtze River Delta is one of the most economically developed regions with the strongest technological innovation capabilities nationwide. The Yangtze River Delta is home to prominent industrial clusters in areas such as finance, information technology, and new energy [11].

3. Increased government support: The Chinese government has implemented various measures to boost regional innovation and growth. These measures include providing financial assistance, tax advantages, training for the workforce, and enhancing the business environment to enhance the creation of local innovation networks. For instance, innovation funds and research result transformation funds have been established to support scientific research projects and emerging industries. Various high-tech industries, technology incubators, and other innovative entities are eligible for income tax and value-added tax reductions and exemptions. In 2021, China's total investment in research and experimental development was 2.8 trillion RMB, an increase of 14.6% over the previous year, and the growth rate was 4.4 % faster than that of the previous year. It has maintained double-digit growth for six consecutive years, which indicates that the government highly prioritizes the advancement of the innovation economy [12].

### **Problems and Deficiencies in the Development of China's Regional Innovation Networks**

Inequality in innovation: the level of innovation in China exhibits imbalanced development with significant regional disparities. Due to unequal economic progress, the uneven distribution of innovation resources has led to differences in the development of the innovation economy across regions. As an example, the eastern region of China has accumulated a substantial amount of universities, research institutions, and a diverse range of high-tech industries, resulting in a significant boost to the establishment of regional innovation networks. On the other hand, the central and western regions, particularly the western region, have comparatively fewer innovation resources because of geographical and economic development circumstances, resulting in an imperfect regional innovation network.

Limited enterprise engagement: Enterprises constitute the central innovation subjects and are among the most critical channels for transforming scientific research achievements into productivity. In certain regions, the collaboration between enterprises, universities, scientific research institutions, and other innovation entities is not sufficiently close. Additionally, the degree of industry-education-research integration is low, leading to insufficient efficiency in transforming innovation achievements.

Imperfect collaborative innovation mechanism: Several deficiencies in the mechanisms for collaborative innovation are obstructing the progress of regional innovation networks [13]. For instance, in certain regions, The collaborative innovation approaches employed by the government are inadequate, particularly regarding the protection of intellectual property, the conversion of technological achievements, and the movement of skilled personnel. Moreover, information sharing among innovation subjects in the innovation network is inadequate and untimely, resulting in resource wastage and inefficient cooperation.

### **Suggestions on Improving the Development of China's Regional Innovation Network**

Given the issues mentioned earlier, the appropriate course of action would be to provide specific recommendations and solutions for targeted development, which are outlined below:

Optimizing the allocation of innovative resources: It is necessary to modify the allocation of innovation resources across various regions, with a special focus on enhancing investment in innovation resources in the central and western regions. Leveraging the resource advantages of each region, a regional innovation network structure with its own strengths and characteristic industries should be established, enabling the development of the innovation economy in each region. These endeavors can also stimulate balanced and expeditious growth of the entire economy.

Strengthening government policy support: The government is a critical innovation subject in innovative activities. Government policies can establish a structured and regulated atmosphere for innovative pursuits, leading to a significant improvement in innovation efficiency. For instance, to enhance the efficacy of governmental services, governments can streamline the procedure for establishing and approving enterprises. Additionally, they should encourage the constitution of innovation hubs like science and technology parks and business incubators, and incentivize enterprises to set up businesses in these parks and take advantage of the benefits and services offered [4].

Increasing enterprise participation in innovation activities: Enterprises should forge stronger ties with other innovation subjects and promote the integration of industry, education, and research. To leverage complementary resource advantages, enterprises, universities, and scientific research institutions should establish R&D centers, joint laboratories, and other innovation platforms [14]. Moreover, the government should provide policy assistance to encourage enterprises to increase their R&D expenditure, which would allow them to develop core competencies in independent R&D and technological innovation.

### Conclusion

Using analytical and inductive techniques, this paper investigates and condenses the present development features of regional innovation networks in China, identifies prevailing problems and inadequacies based on the current development status, and provides suggestions. The study highlights the significance of enhancing the creation of innovation networks at the local level by properly distributing innovation resources, reinforcing government policies, and encouraging more participation from businesses. Given that different countries and regions have their unique development characteristics, specific policy formulation should be tailored to local conditions to promote the development of regional innovation networks more effectively.

### Конфликт интересов

Не указан.

### Рецензия

Все статьи проходят рецензирование. Но рецензент или автор статьи предпочли не публиковать рецензию к этой статье в открытом доступе. Рецензия может быть предоставлена компетентным органам по запросу.

### Conflict of Interest

None declared.

### Review

All articles are peer-reviewed. But the reviewer or the author of the article chose not to publish a review of this article in the public domain. The review can be provided to the competent authorities upon request.

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